COMPTES RENDUS XXII CONFERENCE

IUPAC

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

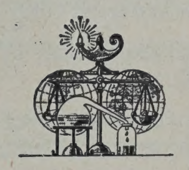
UNION INTERNATIONALE DE CHIMIE PURE ET APPLIQUÉE

COMPTES RENDUS
XXII CONFERENCE

XXII

LONDON

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SECRETARY GENERAL:

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Address to the National Academy of Sciences

The International Union of Pure and Applied Chemistry greets the National Academy of Sciences as it celebrates its Centenary.

Born at a time when political cleavage and civil war threatened the very existence of the United States of America the Academy has steadfastly held to the vision of its founders and has throughout its history been a source of strength and unity to American science. That alone would warrant our respect and admiration, but the Academy has placed us all in its dept by its continued efforts both spiritual and material to further international co-operation in science and has thereby notably promoted mutual understanding among the nations.

The International Union of Pure and Applied Chemistry owes much to the Academy as its official adhering body for the United States of America and to its many members who have given devoted and unselfish service to the Union in its activities on behalf of chemical science in all its aspects. It is our confident hope that the National Academy of Sciences will continue to prosper and that its future may be as glorious as its past.

Cambridge / Basle
October 1963

International Union of Pure and Applied Chemistry

President
Todd.

Secretary General
Morf

INTRODUCTION

Au début de 1964, le Secrétariat général n'était pas encore en possession de tous les rapports relatifs à l'activité des Divisions, Sections et Commissions avant et pendant la XXIIe Conférence qui a eu lieu à Londres du 5 au 9 juillet 1963. Bien des rédacteurs responsables de ces rapports désiraient que les détails en soient soigneusement vérifiés. Il a donc fallu parfois consulter les organismes nationaux adhérents à l'Union, des stations de recherches ou d'autres experts pour être assurés que ces rapports soient de la qualité voulue. Une telle procédure est lente et souvent difficilement réalisable, mais il semblait impossible de laisser de côté ces précautions. Le retard qu'il en est résulté dans la parution des Comptes Rendus est regrettable. Cependant, afin de parer aux inconvénients de ce retard, quelques informations urgentes ont été publiées soit dans le Bulletin d'Information nº 19 qui a paru immédiatement après la Conférence, soit dans le nº 20 qui est sorti au mois de décembre 1963. Les Comptes Rendus se devant d'être complets, certaines de ces informations s'y trouvent reproduites.

Dans son introduction aux Comptes Rendus précédents (XXI), le Secrétaire général avait cherché à persuader les chimistes que l'IUPAC répondait à une réelle et constante nécessité en organisant, chaque année impaire, un grand congrès international – en dépit des commentaires et critiques bien connus que s'attire tout grand congrès. Ce faisant, l'IUPAC cherche à donner aux nombreux chimistes qui travaillent dans les usines ou laboratoires la possibilité de bénéficier de l'atmosphère stimulante d'un grand congrès international.

Il est bien clair que la recherche et l'activité scientifiques progressent en premier chef et même uniquement grâce au travail et à l'effort individuels fournis dans les laboratoires. J'irai même plus loin en déclarant qu'il n'est pas toujours nécessaire de chercher à organiser le travail de recherche, car tous les progrès réalisés dans le passé ont été le fruit d'une intuition ou d'une initiative personnelle. Il nous faut surtout des penseurs. La seule aide qui puisse être apportée au chercheur consiste à créer un climat favorable au développement de ses travaux.

Je me réfère d'autre part à un court article paru dans le Bulletin d'Information nº 18, sorti juste avant la Conférence et le Congrès de l'IUPAC. Il y est relevé qu'un réel danger d'inflation des congrès subsiste actuellement. Le chercheur est sollicité par une telle abondance de congrès qu'il ne lui sera bientôt plus possible de se consacrer suffisamment à ses travaux de laboratoire. L'auteur de cet article mentionne également que tant que l'IUPAC ne sera pas à même de mettre un frein à cette multiplication des congrès, elle n'aura pas accompli sa mission.

Le développement des moyens de communications aériennes permet et augmente grandement les possibilités de réunions internationales. A l'heure actuelle, il existe des agences dont le seul but est d'organiser chaque année un congrès international. Des bureaux de voyages même se chargent de l'organisation de congrès scientifiques, avec possibilités de voyage en groupe ou par avion spécialement affrété, à des prix extrêmement réduits. Il en résulte une augmentation des passagers et c'est ainsi que l'on parvient à remplir les salles de conférences pendant la saison morte.

En résumé, l'IUPAC doit absolument chercher à coordonner et à réduire le nombre des réunions internationales afin d'éviter qu'un autre organisme, moins compétent, ne tente d'exploiter la tendance actuelle qu'on les gens de voyager.

Le XIXe Congrès International de Chimie Pure et Appliquée, qui a eu lieu à Londres du 10 au 17 juillet 1963, est un excellent exemple de l'efficacité

et du succès qu'un grand congrès peut obtenir en matière d'information scientifique.

Passant en revue tout ce qui a été vu et entendu à l'occasion du Congrès de Londres, je me suis trouvé en face de tant d'événements d'importance qu'il m'a paru impossible d'en faire moi-même le résumé pour les Comptes Rendus XXII. Je me suis alors adressé à mes collègues britanniques pour leur demander conseil. Le Président du Comité scientifique, Sir Ewart Jones, m'a fait savoir qu'un rapport officiel ne serait pas prêt avant le printemps 1964. C'est la raison pour laquelle je vais essayer de rassembler pour vous ci-après quelques impressions toutes personnelles du Congrès de Londres.

La cérémonie d'ouverture du Congrès, qui a eu lieu au Royal Albert Hall, fut des plus impressionnantes. Les orchestres combinés des Her Majesty's Grenadier Guards ainsi que des Welsh Guards, en uniforme de gala, offraient un tableau pittoresque et coloré. L'interprétation brillante, sous la baguette du Capitaine R.B. Bashford, fut très applaudie.

Le programme de ce concert mérite qu'on en donne ci-après le détail:

Marche	Prodana Nevesta	Smetana
Selection	Can-Can	Cole Porter
Waltz	Estudiantina	Waldteufel
	El Relicario	Padilla
	Notturno	Alexander Borodin
Valse	Santiago	Corbin
	Neapolitan Serenade	Gerh. Winkler
Suite	Three English Dances	Roger Quilter
Melodies from	Song of Norway	Grieg
	The Ox Minuet	Haydn
	Troïka	Tchaïkovsky
Selection	Blitz	Lionel Bart
March	On the Quarter Deck	Alford

Une assemblée de quelques milliers de chimistes a été saluée d'abord par Son Altesse Royale le Duc d'Edimbourg. Le Président de la Royal Society a ensuite souhaité la bienvenue aux hôtes d'outre-mer. Lord Todd, en qualité de Président du Congrès, et le Prof. W.A. Noyes, Président sortant de l'IUPAC, ont prononcé tous deux un discours.

Avant d'entrer dans le détail des réceptions et des divertissements, je voudrais consacrer quelques lignes au programme scientifique. Les conférences magistrales, tenues par les savants éminents invités par le Comité d'Organisation, ont été suivies par plusieurs milliers de chimistes. Il était donc nécessaire – et le Comité d'Organisation sut bien évaluer la situation – de disposer d'amphithéâtres appropriés. Les grandes conférences ont été données dans deux des plus vastes salles de cinéma de Londres: l'Odéon, Leicester Square, et l'Astoria, à la Charring Cross Road. L'acoustique était excellente et les facilités pour la projection de diapositives exceptionnelles. Ces salles étaient même climatisées. Ces avantages techniques ont été très appréciés, tant par les conférenciers que par l'auditoire, et sont responsables en partie du grand succès du Congrès.

L'après-midi, les communications scientifiques étaient présentées simultanément en douze lieux différents. Il était ainsi possible de discuter les résultats entendus entre spécialistes dans un cadre favorable aux échanges de vues.

Les salles de conférences se trouvaient dans les bâtiments de l'Imperial College, de l'University College, de l'Université de Londres ainsi que de l'Hôpital du Middlesex, lieux classiques de conférences. Le visiteur d'outre-mer a eu donc l'occasion de se familiariser avec cette «Mecque» de la chimie où de nos jours encore les chimistes reçoivent leur formation. Ces lieux ne manquèrent pas non plus d'évoquer de nombreux souvenirs à la plupart d'entre nous qui avons eu la chance d'y faire une partie de nos études.

Comme mentionné plus haut, les résultats obtenus pendant le Congrès étaient d'une valeur scientifique exceptionnelle et chacun s'en est retourné à son laboratoire avec la conviction d'avoir reçu un stimulant extraordinaire.

Il est impossible d'évoquer ici tous les détails des invitations et divers spectacles offerts aux congressistes. La réception au Musée de Géologie fut une occasion unique de retrouver de vieux amis et de faire de nouvelles connaissances. Par une heureuse conception architecturale de ce musée, il était possible d'assister, du haut de la cour intérieure, au va-et-vient des visiteurs.

Le samedi 13 juillet, une excursion à Cambridge et Oxford nous a permis de visiter les laboratoires les plus modernes et de discuter en petit comité les problèmes actuels.

Des dîners furent offerts dans les Guilde Halls et chacun put apprécier la remarquable hospitalité britannique.

Le banquet à la Grosvenor House, qui comptait 1200 couverts, dans une salle magnifiquement illuminée, fut l'événement qui couronna le Congrès.

Il est important de rappeler que Lord Hailsham prononça encore un discours devant l'assemblée des chimistes juste avant son départ pour Moscou où devaient avoir lieu des pourparlers avec les dirigeants soviétiques.

Six mois après ce Congrès, nous sommes heureux de constater que bien des espoirs exprimés par l'assemblée se trouvent en voie de réalisation. Dans sa réponse à Lord Hailsham, le Président du Congrès, Lord Todd, a évoqué entre autres ses expériences faites comme étudiant de notre ami Sir Robert Robinson au Dyson Perrins Laboratory d'Oxford.

Les experts en nomenclature de chimie organique éprouveront passablement de difficultés à trouver un synonyme pour les termes «Railway hydrocarbon».

Nous citerons encore les représentations spéciales de théâtre et de ballets. Une soirée dansante s'est déroulée sur les bords de la Tamise le soir même où le Prof. E.R.H. Jones fut reçu par Sa Majesté Elisabeth II et fait Chevalier.

Passons au programme réservé aux dames. Le Comité d'Organisation responsable, présidé par Lady Todd, fit l'impossible pour permettre aux dames de visiter les monuments historiques et autres curiosités d'ordre artistique et social de Londres: musées d'art, hôpitaux, écoles. On descendit la Tamise jusqu'à Greenwich pour une visite de l'observatoire et du Painted Hall.

La séance de clôture du Congrès s'est déroulée simultanément en deux endroits: au Cinéma Odéon et au Cinéma Astoria. A l'Odéon, après les conférences données par le Prof. A. Eschenmoser, Zurich (Suisse), sur les «Studies on the Synthesis of Corrins» et par le Prof. W.S. Johnson, Stanford, Californie (USA), sur les «Recent Studies on the Synthesis of Homocyclic Systems», Lord Todd prit la parole pour remercier les chimistes de leur présence et de leur intérêt et le Prof. Roger Adams, à son tour, exprima ses vifs remerciements au Comité d'Organisation du Congrès.

Une séance similaire se déroula à l'Astoria. Deux conférences furent présentées, l'une sur l'«Organic Chemistry in Peptide Synthesis» par le Dr J. Rudinger, Prague (Tchécoslovaquie), l'autre par le Prof. F. Sondheimer, Rehovoth (Israël) sur les «Recent Advances in the Chemistry of Large-ring

Conjugated Systems». Sir Ewart Jones prononça les paroles de clôture du Congrès.

Je pense que tout le monde sera d'accord que je me fasse leur interprète pour remercier chaleureusement nos hôtes britanniques, en particulier la Royal Society, le British National Committee for Chemistry, la Chemical Society, la Society of Chemical Industries et les membres des divers comités d'organisation. Grâce à eux, le XIXe Congrès demeurera pour chacun un souvenir inoubliable.

R. Morf

Vendredi 5 juillet – l'après-midi
(séance publique dans les bâtiments de la London University Union suivie d'une séance à huis clos à l'Engineering Building de l'University College)
Samedi 6 juillet – le matin, à l'Engineering Building de l'University College
Mardi 9 juillet – tout le jour, à l'Engineering Building de l'University College

Présents: Le Prof. W.A. Noyes Jr. à la présidence
Les membres du Bureau et les délégués des Organismes nationaux adhérents cités aux pages 39–44.

Toutes les formalités ont été prévues et remplies pour permettre au Conseil de prendre des décisions valables.

Les Comités nationaux adhérents et les membres du Bureau ont été invités par le Secrétaire général, par lettre recommandée du 28 décembre 1962, à participer à la XXIIe Conférence à Londres. Cette lettre d'invitation était accompagnée d'un premier projet de l'ordre du jour. Elle attirait particulièrement l'attention sur les points 3 et 4 de l'ordre du jour relatifs à l'adoption des nouveaux statuts et du règlement (6 mois avant l'ouverture de la Conférence, conformément aux statuts alors en vigueur). Mention y était aussi faite des élections. Par cette lettre, les Comités nationaux adhérents étaient également priés de faire leurs commentaires sur les nouveaux statuts, de proposer des points additionnels pour l'ordre du jour et finalement de proposer des candidats pour le Bureau.

La traduction en français des nouveaux statuts a été faite grâce à la courtoisie du Comité national français sur la base d'une version anglaise portant la désignation «projet juillet 1962» (lettre de demande du Secrétaire général datée du 21.9.62). Cette version française a été distribuée aux Organismes nationaux adhérents et aux membres du Bureau en décembre 1962.

La version anglaise a été distribuée un peu plus tard, exactement six mois avant l'ouverture de la Conférence.

Le rapport du Président sur l'état général de l'Union, en français et en anglais de même que le Rapport du Trésorier et le Rapport de Vérification de la Neutra fiduciaire S.A., Zurich, ont été envoyés aux Organismes adhérents et aux membres du Bureau 4 mois avant l'ouverture de la Conférence.

Le Comité ad hoc des Finances avait été préalablement invité à vérifier les comptes de l'Union. Chaque membre était prié de se rendre à l'Union de Banques Suisses à Zurich, où tous les détails et tous les documents relatifs aux finances de l'Union se trouvaient à sa disposition.

En date du 28 mai 1962, le Secrétaire général a adressé aux Organismes nationaux adhérents et aux membres du Bureau une lettre explicative ayant trait aux élections qui devaient avoir lieu pendant la Conférence de Londres. Cette lettre était accompagnée d'une liste des candidats proposés aux élections et de notices biographiques.

Afin de créer une situation tout à fait claire en ce qui concerne le projet des nouveaux statuts, dont il existait plusieurs versions, le Président Noyes décida d'en faire imprimer la plus récente, où il était tenu compte des modifications rédactionnelles apportées par le service juridique de la Royal Society, sur papier de couleur. Cette version, portant clairement le titre de «Draft», devait être distribuée à tous les participants de la Conférence. De même, les rapports imprimés des Présidents de Division ont été distribués aux participants de la Conférence.

Dans l'intention d'intéresser les chimistes aux activités de l'Union, le Président Noyes avait décidé d'ouvrir la Conférence par une réunion publique. Cette réunion eut lieu dans l'après-midi du 5 juillet dans les

bâtiments de la London University Union et fut suivie d'une réunion à huis clos et officielle qui fut tenue, elle, à l'Engineering Building de l'University College.

Les discours prononcés lors de la séance publique ont fait l'objet d'une publication dans le Bulletin d'Information et se trouvent également reproduits dans les présents Comptes Rendus. Le procès-verbal des réunions du Conseil se trouve à la page 153.

R. Morf

INTRODUCTION

At the time of writing (January 1964) all the reports from the Divisions, Sections and Commissions pertaining to their activities before and during the XXIInd Conference in London, have not been received in the Office of the Secretary General. Many of those responsible for these reports felt that it was necessary to check the various data very carefully. Also, it was advisable to ask for comments from Adhering Organizations, Research Institutes and all those experts who are competent in the various fields of activities. This is an extremely time-consuming and cumbersome procedure but it is unavoidable if reports of high quality are to be produced.

The delay in publishing the Comptes Rendus is very regrettable and it was therefore necessary to give some advance information in the last two Information Bulletins issued immediately after the London Conference and in December 1963 respectively. Some of this advance information will be reprinted in the Comptes Rendus XXII to enable you to have a complete record. In the introduction to the Comptes Rendus XXI, the Secretary General tried to convince chemists that it is still desirable that the International Union of Pure and Applied Chemistry should organize each uneven year an International Congress so that as many active chemists as can possible profit by the stimulating atmosphere which can only be created in a big international gathering.

This view I have continually stressed although I would not wish to detract from the value of small symposia with limited membership where workers in one particular field may meet and by discussion stimulate overall progress. At the same time, we must always remember that real progress in research comes essentially from thought and hard work in the laboratory and that indefinite multiplication of meetings and symposia all over the world is not without its dangers, in that they can occupy too much of the time of young scientists. Moderation should be the keynote and it is particularly desirable that meetings should be well and responsibly organized. As I have already indicated in my article in Information Bulletin No. 18, I believe that IUPAC should endeavour to rationalize things by having a well-planned programme of meetings for some years ahead and by confining its support to such activities as accord with it. Otherwise, we are likely to be plagued by an endless series of ill-considered conventions of little value except to the travel agents.

The XIXth International Congress of Pure and Applied Chemistry held in London from July, 10 to 17, 1963, was a good example of a large Congress which succeeded as a stimulus for a large number of chemists working in universities, colleges, government agencies and industry.

The many activities conveyed to me such a variety of impressions that it is too difficult for me to make a detailed survey of this Congress for the purpose of the Comptes Rendus. However, I will try to give my thoughts to you.

The Opening Ceremony in the Royal Albert Hall, which inaugurated the XIXth Congress was extremely impressive. The colourful pageant of the Combined Orchestras of Her Majesty's Grenadier Guards (by permission of Col. A.G. Way M.C.) and the Welsh Guards (by permission of Col. C.A. La T. Leatham) in itself provided a very picturesque setting. Their brilliant performance, led by Captain R.B. Bashford, was well acclaimed. The provision of such a concert programme was an extremely good idea as it takes a long time for five to six thousand people to enter an auditorium. The well selected programme included the following:

March	Prodana Nevesta	Smetana
Selection	Can-Can	Cole Porter
Waltz	Estudiantina El Relicario Notturno	Waldteufel Padilla Alexander
Valse	Santiago Neapolitan Serenade	Corbin Gerh. Winkler
Suite	Three English Dances	Roger Quilter
Melodies from	Song of Norway The Ox Minuet Troika	Grieg Haydn Tschaikowsky
Selection	Blitz	Lionel Bart
March	On the Quarter Deck	Alford

The gathering was addressed by H.R.H. The Duke of Edinburgh KG., F.R.S., Sir Howard Florey—President of the Royal Society, The Rt. Hon. The Lord Todd F.R.S. and Prof. William Albert Noyes, Jr.

Before mentioning the receptions and social events, let me make some remarks about the scientific programme. The big general lectures of the Congress were attended by several thousand chemists. The organizers are to be congratulated on the arrangements they made to deal with these large audiences so successfully.

The Congress lectures were held in the Odeon Cinema in Leicester Square and the Astoria Cinema at Charing Cross Road. The acoustics were excellent and the provision for projection of slides and drawings was faultless. These theatres were airconditioned and these technical facilities were greatly appreciated by the lecturers and the audience and materially assisted the great success of the Congress.

In the afternoons, papers on specialized topics were read in about 12 auditoria simultaneously, thus creating an atmosphere for mutual discussions in relatively small groups.

Those of us attending sessions in the traditional-style lecture theatres of Imperial College and University College, and who had earlier been fortunate enough to study in England, found old memories being awakened. We were like travellers again visiting the Mecca of our youth, and for once we were glad to find that some, at least, of the old theatres had not yet been replaced by modern glass and concrete palaces!

As already mentioned, the scientific outcome of the Congress proved to be of outstanding value and everybody returned home with the feeling of having achieved something.

It is impossible for the recorder to give full details on the many social events. Just a few of them are commented on below.

The Reception in the beautifully decorated premises of the Geological Museum presented a unique possibility of renewing acquaintances and making new friends, and it was admirably arranged.

On Saturday July 13, trips to Cambrige and Oxford were organized. Here also, chemists took the opportunity of discussing on the spot problems of mutual interest.

The reception given by the Twelve Great Livery Companies of the City of London, and the dinner given to overseas delegates by the Worshipful Company of Salters not only underlined the traditional British hospitality, but gave us the opportunity of seeing something of the ancient traditions of the City of London and its Guilds.

The Congress Banquet at Grosvenor House with 1200 guests, in a beautifully illuminated hall, was the highlight of the Congress. It was a very special coincidence that Lord HAILSHAM spoke at the Banquet just before his departure for Moscow for the memorable conference with the Soviet leaders. Now six months later, we are glad that some of the optimistic hopes at least are on the way to being realized.

The President, Lord TODD, replied to Lord HAILSHAM and recalled his delightful experiences as a young student with our old friend Sir ROBERT ROBINSON in the Dyson Perrins Laboratory at Oxford. Those chemists familiar with Organic Nomenclature might be in a little difficulty as to what is really the "Railway Hydrocarbon"!

A special Ladies' programme was arranged and this was handled very efficiently by the Ladies' Committee presided over by Lady TODD. A special acknowledgement is due to the Ladies Committee for the excellent arrangements. One of the highlights of this programme was an excursion to Greenwich where one could visit the famous Painted Hall.

The closing session of the Congress was held in two places. Lord TODD and Prof. ROGER ADAMS addressed the meeting at the Odeon Cinema at the time of Prof. A. ESCHENMOSER's lecture on "Studies on the Synthesis of Corrins" and "Recent Studies in the Synthesis of Homocyclic Systems" by Prof. W.S. JOHNSON. Sir EWART JONES concluded the meeting at the Astoria Cinema where Dr. J. RUDINGER lectured on "Organic Chemistry in Peptide Synthesis" and Prof. SONDHEIMER on "Recent Advances in the Chemistry of Large-ring Conjugated Systems".

I am sure that all members of IUPAC will wish to join me in expressing our sincere thanks to the members of the Royal Society, the British National Committee for Chemistry, the Chemical Society, the Society of Chemical Industry, the members of the organising committees and indeed all our British hosts for the wonderful time they gave us in their country.

R. MORF

XXIInd Conference

The XXIInd Conference was held before the XIXth International Congress, in the Engineering Building of the University College. The President, Prof. W. A. Noyes Jr., initiated a new feature of having an Open Meeting on Friday, July 5, at 2 p.m. in London University Union. This Open Meeting could be compared with the General Assembly in that not only delegates to the Council were allowed but everybody with an interest in IUPAC was invited. Most of the talks at the Open Meeting have already been published in the Information Bulletin No. 19, however, these are also reprinted in this Comptes Rendus.

The Council meetings were held in the Engineering Building of the University College and the Minutes are listed on page 152–161. The Reports of the Division Presidents are also included and those Commission Reports which were received by the time of printing have also been included.

The Bureau and the Executive Committee meetings were held in the Engineering Building. Whilst the Agenda for these meetings have been listed on page 162–169, the Minutes have been reproduced only covering the main features as most of the items were referred to the Council and thus the Council Minutes cover the detailed work of the Conference.

Immediately before the London Congress, a Symposium was held in Paris on Macromolecular Chemistry under IUPAC sponsorship and in co-operation with the relative Commission. The Vth International Pesticides Congress was also held in London and was presided over by Sir Robert Robinson. A Symposium on the Chemistry and Biochemistry of Fungi and Yeasts in Dublin followed the Congress. Finally, together with the Commission on Molecular Spectroscopy, at the invitation of the Hungarian Academy of Science, the VIIth European Symposium on Molecular Spectroscopy was held in Budapest. R. Morf

ADDRESS OF THE PRESIDENT OF THE ROYAL SOCIETY – SIR HOWARD FLOREY

Mr. Chairman, ladies and gentlemen, one of the pleasures of my office is on occasions like this to be able to convey to you here assembled from many countries of the world the best wishes of the Royal Society for the success of your deliberations. As you know the Royal Society is the body responsible in this country for the activities of ICSU and hence is the organization in this country behind your great Union IUPAC. It is therefore our pleasure and our duty as a society to do our best to see that while you are here you have everything arranged for your comfort and convenience. If there is anything more that can be done you have only to ask us, and the staff of the Royal Society, for our resources are entirely at your disposal. Now it cannot have escaped the notice of anyone that your Union is now very large; that its responsibilities are ever expanding and that at this meeting you face decisions which may greatly affect not only the future of your Union but also the future of ICSU. Now I have had an opportunity of perusing your Information Bulletin for June 1963 and I was interested to see that a note is made of the fact that there is a general complaint from Universities, Research Institutes, and Chemical Industries that there are too many conventions, and that we are within sight of having so many symposia, colloquia, and so on, that few chemists will be left in their laboratories to produce work for display and discussion at such gatherings. Now there is no doubt a great deal in this complaint and I am sure your Union is going to address itself to organizing only meetings which will serve a very useful purpose, but whatever the quality of the scientific papers that are produced at these meetings I think that we are all agreed that what is now coming to be called by the somewhat evocative term of "fall out" is probably of as great importance as the presentation of papers and lectures, and I think no one would deny that some of this "fall out" is the opportunity for scientists from all parts of the globe to meet one another, for often more is done for international understanding and for scientific advance while quaffing national or even international drinks than in the more formal sessions of such gatherings. I therefore hope that you will have ample opportunity for personal talks during your stay here, and I hope also that the Royal Society will facilitate these by what it is allowed to do in connexion with your programme. In short, may I say, on behalf of the Royal Society, how glad we are to see you all here and to wish you all a most successful meeting, with friendly discussions from which wise decisions will emerge.

Dr. H. W. Thompson then replied:

Thank you very much Sir Howard. Already we have some food for thought. And now I am to call on the President of IUPAC Prof. Noyes to give us a talk, and I believe it is to be on international relationships in science or some theme of that kind. I am not sure what I should say about Dr. Noyes. I have known him I think now for well over thirty years and seen him in many parts of the world and in many different situations. He has of course recently migrated, as everyone or many people here will already know, from Rochester to a more flamboyant Texan University where he is to set up science in a big way. He is already claiming to be a Texan but then he would not be fitted to go to Texas if he were not. I have great pleasure in calling upon Dr. Noyes to give us his talk today.

ADDRESS BY THE PRESIDENT OF IUPAC – PROF. W.A. NOYES JR.

on the 5th July 1963 at the Open Meeting of the Council

Sir HOWARD, Dr. THOMPSON, members of the various delegations and Commissions and Committees of IUPAC. I am not quite sure just how I should give this talk. I think by the Statutes I am obligated to give it both in French and in English, and in the absence of simultaneous translation I am going to do the best I can in these two languages. If perchance you are unable to tell which language I am speaking, this I assure you will be my fault and not yours.

Since I was introduced as a Texan I should say that not long ago, a woman in court in Texas was asked to give the nationality of her mother, and she said "Texan", and the judge said "now we are proud of our State, we must be modest, however, you should say that you are an American and not a Texan". "Ah", but she said "my mother's mother was born in Texas in 1837 when it was an independent country." And in fact if you go to Austin, Texas, the State Capital, today you will find a house which is labelled the Embassy of France.

Now this experiment that we are trying this afternoon is a meeting which resembles in a way a national or an international Assembly. In the former structure of this Union there was a General Assembly, and the first meeting I attended in 1923, had delegates to the Assembly and delegates to the Council, and as a young man I was allowed to sit but not to talk; and in fact nobody talked very much except a few officers in those days. The General Assembly was abolished some time in the late 1930's or immediately after the war—I have forgotten which—but nevertheless there is some point in having together all those people who work for the Union in one way or another. The real work of the Union is done by the Commissions, by its Committees, by a lot of people who deserve much more credit than they receive, and so this is an attempt to get them together and to tell them a little of the story of the Union, what it is, what it hopes to do.

This Union was founded in 1919 as part of a group of Unions established by the International Research Council, which in turn was founded under the aegis of the Committee of Intellectual Co-operation of the old League of Nations. The first meetings of this Union were held in the fall of 1919 not long after the Armistice, within a year; and at that time the delegates from the various countries called upon to form this Union were a very distinguished group, and the first President of this Union was HENRI MOUREUX of France and there have been a series of distinguished Presidents, up until the present one who has somewhat gone down the scale.

We do not need to give the history of this Union between the two wars in detail, because, the present concerns us much more than the past, but what I would like to do is to begin with the history immediately after World War II, and tell of some of the events which have happened and which have changed the character of science, of international relations in science. In the first place we started after World War II with the United Nations. The United Nations is a political body; the representative on it, the Nations adhering to it do it through their governments; it has a Security Council; it has various Committees and Commissions, but we must never forget that it is primarily a political body.

The United Nations, when it was founded, had associated with it a series of specialized agencies. These are now seventeen in number and these

specialized agencies many of them deal with scientific subjects. I will mention only a few WHO; WMO; ILO; UNESCO.

Now these organizations all have somewhat similar structures to UN itself. Each one has a Director-General; each one has some kind of a governing body called variously an Executive Board or a Bureau or something of this type and then they all have Assemblies or Conferences which meet at periodic intervals; the numbers of members of these various organisms vary from a minimum of about 52 to a maximum today of 113. Now these various bodies, some of which do deal with science, as I have already pointed out, are also political bodies. The questions which come up are often treated on a political basis and since many of these organizations have large numbers of states of certain complexities the votes on certain subjects follow certain lines which can almost always be predicted; and when a subject gets into a political domain it can be treated on a somewhat different basis from what we believe scientists commonly use. And so we have as we go along through this long list of specialized agencies, subjects which cause a great deal of political concern, such as one runs into with the Labour Organisation, and those which are so universally accepted as being of necessity, as the World Meteorological Organization, that few political questions are really raised.

Now there is one of these organizations about which we, as members of IUPAC, need to bother a little more than with the others, so it is that one which I am going to discuss must fully for you, and although I am sure many of you know all about it, I hope that some of you will learn something. I refer to UNESCO. The International Council of Scientific Unions which was the name given to the International Research Council in the late 1920's was a body which became quescent during the Second Great War. Scientists were dispersed, they had little contact with each other, laboratories had been distroyed, and the scientific organizations therefore had been somewhat destroyed or at least put to sleep. At the end of the war when UNESCO was being founded there was formed here in London on Belgrave Square a Preparatory Commission for UNESCO, and Dr. JOSEPH NEEDHAM was the first Director of the Science Section of that Preparatory Commission, and he felt that instead of starting a great number of new organizations, he would try as far as he could to make use of some which already existed. Therefore, Dr. JOSEPH NEEDHAM and Prof. H. R. KRUYT of the Netherlands, who later became President of this Union, held a meeting at a famous restaurant called le "Coq d'Or", which was de Gaulle's favourite restaurant in London during the War, to try to work out an agreement between UNESCO and ICSU. They worked out a contract between them whereby UNESCO would give a grant-in-aid to ICSU, a grant-in-aid which would permit ICSU and its Unions to begin operations after the war. The first grant-in-aid to ICSU by UNESCO was voted by the first General Conference of UNESCO in the fall of 1946 and amounted to 275 thousand dollars per year. Now it is only fair to say that this grant-in-aid was a subject of a great deal of debate, discussion, and even disagreement. The disagreement was not between scientists, who I think were all completely in accord that this kind of money should be given to ICSU, but there are other disciplines somewhat jealous of the scientists and of the ease with which the scientists came to understand each other, and also there was some kind of a feeling that a long term grant would be unnecessary or even inadvisable. The result of all this was that the 275 thousand dollars originally given to ICSU decreased to 225 thousand dollars, then I believe to 200 thousand dollars and finally to 175 thousand dollars where it stayed for many, many years. There were at that time eleven Unions, members of ICSU, and the number has gradually grown to fourteen. But it is easy enough to see that with a

fixed sum being given to ICSU there were jealousies and every time a new Union was added the money was divided in more ways and this tended to make the existing Unions very reluctant to add any new members to ICSU, and this in turn, I am sure, tended to prevent a desirable growth of ICSU. The Director-General of UNESCO is proposing for the budgets 1965 and 1966 that the 175 thousand dollars be increased to 225 thousand dollars. It remains to be seen what the Conference of UNESCO in the fall of 1964 will do to this budget proposition.

I do not need to give you a detailed history of the science programme of UNESCO. It covers a great many different things. It has something to do with the popularization of science. There are regional offices, now five of them, established in various parts of the world which help scientists travel, get information from each other, get documents and books and apparatus. It has other programmes which have to do with documentation, it has also a programme which has to do with the arid zone, proposed by the Government of India, and which is now terminating, and the programme on the Indian Ocean, an extensive programme on the Indian Ocean, in which the vessels of many countries are participating. It also has a programme which deals with things connected with space, but here the main emphasis is in other agencies than UNESCO. It is only fair to say that with one hundred and thirteen votes in the General Conference of UNESCO the centre of gravity of this voting is bound to shift in favour of those countries which are in need of technical assistance, or improvement in education. I refer to those large areas of Africa, of South Asia, of Latin America where the needs are great and the facilities are perhaps too small. And there is a great desire on the part of many nations to help, but these nations receiving this help often prefer to do it from a United Nations body rather than by bilateral means.

The budget of UNESCO was fixed originally in 1946 at 6 million dollars (per year), it is now approximately 30 million dollars (per year). The Director-General is asking for 1965 and 1966 a budget and what he asked originally for was 42 million dollars, and it is almost certain that this will be cut at least to 39 for the biennium. The science budget was originally fixed at 975 thousand and for one reason or another this was cut until it reached 650 thousand and now it has begun going up again, so the actual budget of science in UNESCO today is somewhere in the neighbourhood of one and half million dollars. But the amount which is in the UNESCO budget is not all; there are other figures which come from Technical Assistance funds, and what is often called the United Nations general fund, and from one source or another outside UNESCO's regular budget. Most of this outside money goes to special purposes of technical assistance, so the amount given to ICSU is small.

I see that my time is running out, and I must get along to ICSU. What has ICSU done? Why does it deserve our support? Well, ICSU as a result of this grant-in-aid from UNESCO became a distributing body, a hand-out, a port barrel, as we say in the United States, a means of getting something for nothing. Now if you were to have the great pleasure, as I had for some years, of trying to decide whether a project in physics is better or worse than some project in biology, then you are comparing two things so totally different that the comparison becomes almost absurd and the requests for money are always several times the amount available at any one time. In any case, the grant-in-aid was not sufficient to pay more than a small fraction of ICSU's cost, and the total amount of money direct, and indirect spent by ICSU and its fourteen Unions today is probably somewhere in the neighbourhood of 750 thousand dollars. But this again gives you only a small idea of what is going on.

ICSU was responsible for initiating the International Geophysical Year. This was done by establishing an office, with a small grant-in-aid from UNESCO of about 25 thousand dollars. Now IGY before it ended, spent something over 750 million dollars. This money of course was spent by the Governments on their own vessels, their own aircraft, on their own space vehicles and satellites; it was spent by Governments through their own citizens, but the programme was co-ordinated by the Committees of ICSU. But this was a large effort which was exceedingly successful. I have only to mention a couple of things to let you know how successful that was; the exploration of the Antarctic Continent, which was done by many nations, and with a treaty which permitted all of the nations equal access to that Continent and, through the requests of ICSU to UNESCO to the United Nations, a treaty has been continued which permits all nations to use that Continent for exploratory purposes. And so you have ICSU giving advice to the United Nations, not only here but on other matters pertaining to the Continental Shelf. Will the ships of one nation be able to explore the territorial waters of another country? What is the distinction between a scientific expedition and an expedition which might have a hidden military value? There must be safeguards. So we have here advice from ICSU which has had far-reaching explorations possibilities. How far does one have to go before one gets out of Continental air? I am reminded of the City of Chicago—this I think is a true story—which passed a law some time ago that no building could be over twenty storeys high. The City Gas Company built a building thirty storeys high, and of course they were taken before the judge on this matter, and the judge ruled that the top ten storeys were outside the City limits and did not have to be taxed. Well I could go on and tell you things that ICSU has done. The amount of money which this Union receives from ICSU varies from year to year, in somewhere to order of magnitude of 12 to 15 thousand dollars. This money goes to help us organize congresses, and conferences, to pay travel and so forth.

Now what is the need for ICSU today? Well the need is an evident one to those who have thought about the subject. You have a United Nations; you have these seventeen specialized agencies; and they have scientific questions, or at least questions which have scientific implications, thrust at them for one reason or another. It is necessary therefore to have some kind of an independent, preferably non-Governmental body, which can call upon all of the scientists of the world to help it through its committees, its Unions, its Commissions of one kind or another, to give advice to UN and to the UN specialized agencies. This is a very real need, a need which must be met as far as possible on a non-political basis, and therefore we believe that ICSU should be strong, that this Union should support a strong ICSU. Fortunately we have here on the platform Dr. Thompson who has been Chairman of the Committee which has been drawing up a new structure for ICSU. ICSU has not been able well to fulfill all the demands put upon it; it has not had the finances; it has not had frankly the support of all the Unions as it might need such support. Dr. Thompson and his Committee have drawn up a very good proposal for making the structure of ICSU more viable. But no structure and no organization is better than the man who can make it work, and so I think we all not only have to do what we can to put the new structure into effect, but to see that ICSU when it needs help can call upon the best people.

Well I am not going now to tell you all about IUPAC. You can read; you have my report. It is written in both French and in English, and thanks to our French colleagues, in good French I hope—my wife tells me that I talk better than I can write it. My English I will only say is typically

American but somewhat comprehensible on this side of the Atlantic. I can only say that this Union itself needs strengthening; it needs more money; it needs help; and thanks to many nations, and many people it is getting this help. With all due respects to our Treasurer we cannot ask for much more money until we run a large deficit, and no Treasurer would ever gladly approve a budget with a large deficit.

Now in conclusion, since I am going to let you read about the structure of the Union and what it is supposed to do, I want to express publicly my thanks to all of those of you who have served on Commissions and Committees, who have given devoted time to IUPAC, to the members of the Bureau who have been of the greatest help and very co-operative—they have even had to put up with my French from time to time—but most especially to the members of the Executive Committee. When we began to meet some of us had known each other; some did not. We have not always agreed with each other, but we have become better friends as we got to know each other, and I think today when we made decisions even though they may not always be unanimous, nobody feels that these decisions are being made in a personal way. Each person is given the credit for an objective point of view. But there is one person—really two people—that I must mention particularly, Sir CHARLES DODDS, because of other heavy responsibilities has found it necessary not to stand for election again as Honorary Treasurer of this Union. He has been with us I think, since 1957; he is a man of great wisdom, of charming personality, and always a good friend. We will miss him sorely, and I can only say personally that I hope our friendship will not be stopped because he and I are both going out of office.

The other one is the Secretary-General, who has devoted his time, time away from his family and from all of the other activities which he might have undertaken, to this Union, it is a better Union because he has done this and I wish to express to him my personal thanks for having helped me, who at a distance of 3000 miles from the centre of gravity of the Union would have found it impossible to work by myself. And to all of the members of the Executive Committee I express my thanks. I will not mention the others; I will leave that to somebody else. But I can only say that while I am happy to have been President for four years my wife will be delighted that my four years are coming to an end, and I think with Dr. THOMPSON's permission we now call on Dr. MORF to tell us a little bit about the finances of the Union.

LORD TODD'S ADDRESS AT THE CLOSE OF THE COUNCIL MEETING

London—9th July 1963

My formal duty in taking the Chair at this stage is to bring the meeting of the Council to a close, but before doing so I have two things I should like to say.

First of all I am greatly honoured that you should have elected me as your President and I cannot say more than that I shall do my best to serve the Union and to give it and you the service which you have a right to expect from your President.

But in particular I would like to take this opportunity of saying, not only on my behalf but on behalf of the Union itself, how greatly we are indebted to our outgoing President. During the last four years the Union has gained steadily in strength and is becoming a more and more effective and active international chemical organisation. The high status which it has achieved owes a very great deal to the guidance which we have had from Dr. NOYES, to his skill, patience and forebearance in dealing with us—and it must be admitted that we are difficult to deal with at times. Dr. NOYES has spared no pains as a member of the Executive Committee in dealing with the manifold problems which have arisen and he has dealt with them with consummate skill. He has been a great President and this Union owes him a very great debt of gratitude. I may add that it is to me a great pleasure that he will continue as a member of the Executive Committee in the capacity of immediate past-President and I shall hope to have the benefit of his wisdom and experience during my term of office.

OPENING ADDRESS OF THE XIXth CONGRESS BY HIS ROYAL HIGHNESS THE DUKE OF EDINBURGH

Royal Albert Hall, London—Wednesday, 10th July 1963

The choice of this the Royal Albert Hall for the Opening Ceremony of the 19th International Congress of Pure and Applied Chemistry is very pleasantly appropriate.

In the early 1840s there was much dissatisfaction with the state of chemistry teaching in Britain and it was a group of people under the chairmanship of Prince Albert, the Prince Consort—after whom this Hall is named (although I do not think he had the ordeal of having to speak in it) —it was this group which decided to found a Royal College of Chemistry in London. The great German chemist von Liebig was asked to suggest a director and it is interesting that the choice of Hoffmann from among the three names put forward by von Liebig was made by Prince Albert himself.

It so happened that Queen Victoria and the Prince were in Bonn in connection with some Anniversary celebrations of Beethoven's birth so the Prince took the opportunity to revisit the lodgings he had occupied himself as a student in Bonn and by sheer chance these same lodgings were occupied at that time by Hoffmann who was working at the University. The two met and the Prince was so impressed that he asked the King of Prussia at once to give the young man 2 years leave to start the new college in London. Well, Hoffmann came and stayed not 2 but 20 years before returning to take the chair in Berlin in 1865.

Today the Royal College of Chemistry is incorporated in the Imperial College of Science and Technology which is quite close to where we are gathered today and which is the direct successor to Hoffmann's original College.

In spite of the relatively poor communications and transport arrangements of those days, the College attracted a great number of students from Europe and one also gets the impression that the international movement and contact between the foremost chemists of Europe was at least as great as it is today.

One other significant point about the Royal College of Chemistry is that Hoffmann arranged matters in such a way that the pure and applied aspects of chemistry flourished together, so that the practical implications of new findings in research were quickly seized upon and developed.

This, the International Union of Pure and Applied Chemistry, carries on the same tradition of world-wide contact and communication between scientists and workers in pure and applied chemistry and it is a very great pleasure to be able to welcome such a large number of distinguished chemists from so many parts of the world to London and to this Congress.

I hope very much that in the business meetings, at the scientific sessions, in private discussions, at the social functions and during the programme of visits, you will be able to exchange problems and ideas, stimulate new trains of thought and make many new and, I hope, lasting friendships.

Even the most brilliant intellect tends to go off the boil in isolation; it needs the fuel of discussion and argument to get it bubbling again and I hope this is what will happen to you in the next week.

And so my only duty this afternoon is to bid you all welcome and wish you all a very happy visit to this country and to hope that this Congress will be a resounding success. Well, I have done all that but I cannot resist adding one general comment.

The world is being flooded with an ever-growing river of scientific discoveries of an ever-increasing complexity and still the major research effort is being directed to even more discoveries. This is very laudable but speaking entirely as a layman and a bystander I must admit to a growing anxiety about the long-term influence and side-effects of many recent applications of scientific discoveries. Science has been glamourised for so long that many people firmly believe that it can do no wrong. This is a very dangerous attitude particularly because there have been several indications in recent years that it can in fact go wrong.

I believe that this is one of the vital responsibilities of scientists to protect mankind as well as all the living creatures of our world from the unintentional, the unpremeditated and unforeseen results of the application of scientific knowledge. I have mentioned this because I see that your Union is responsible not only for the advance of chemical knowledge but also for its application.

Well, ladies and gentlemen, having got that off my chest, it only remains for me to congratulate all the organisers of this Congress and to declare that the XIXth International Congress of Pure and Applied Chemistry is now in session.

PRESIDENTIAL ADDRESS by Lord Todd, F.R.S.

President of the Congress and President of the International Union of Pure and Applied Chemistry

Address delivered at the Congress Opening Ceremony, Royal Albert Hall, London, Wednesday, July 10, 1963

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Sixteen years have passed since the last International Congress of Pure and Applied Chemistry was held in London. That 1947 Congress marked the resumption of the activity of the International Union of Pure and Applied Chemistry after the chaos of the war years and I well remember the intensity of feeling at the possibility it gave to all of us to renew old contacts and to forge new friendships with our colleagues from other lands. Since then we have held an uninterrupted series of Congresses, but even if the special character of 1947 is missing I can assure you that British chemists extend to all our foreign guests a very warm welcome to London and we hope that our Congress in 1963 will prove as rewarding and as enjoyable as was its predecessor.

These 16 years have certainly been momentous ones in the onward march of our material civilisation and in man's conquest of his environment. The pace of scientific and technological advance, already tremendous in 1947 has increased still further and shows no sign of slackening. This is the period in which we have seen the harnessing of nuclear energy, the massive development of television, the commercial age of jet aircraft and the first voyages of man into extra-terrestrial space. These are, of course, among the most widely publicised developments and it is, I think, fair to say that the more obviously associated areas of pure science have been highly glamourised so that, indeed, it would sometimes seem to the lay public that the terms physics and science are synonymous. But although chemistry has been, for a variety of reasons, much less in the public eye its achievements have been no less massive and indeed the spectacular developments mentioned above could not have been realised without it. For chemistry occupies a central place in science—it is the provider of the new materials and combinations of materials which permit advances to be made in wide areas of science and technology as well as those which add directly to the comfort and well-being of mankind, and it holds the key to the understandnig of biological processes.

The progress in the science of chemistry and in its application during the period since the last London Congress has been as remarkable as that in any area of science. Our theoretical concepts have been vastly refined and in certain respects well-nigh revolutionised and whole new vistas are unfolding as a result. This too is the period in which the general structure of nucleic acids and proteins has been established, and the structure of vitamin B_{12} and its coenzyme worked out. Synthesis has been perfected to realise the total synthesis of such complex molecules as strychnine, chlorophyll and several coenzymes and the bio-synthesis of the steroids has been elucidated in detail. It has seen a great renaissance in inorganic chemistry and the remarkable rise of organometallic chemistry. In areas of direct industrial significance we have seen new polymers and plastics and in particular the discovery of low-temperature polymerisation of simple olefins and of stereospecific polymerisation each fraught with great potentialities. The new

chemistry of boron and other elements, the reactive dyes, drugs of the steroid group, the development of catalysis and catalytic processes which have made petroleum a major source of industrial chemicals, all these and many more stand to the credit of our science. I shall not attempt a catalogue; even those few examples will serve to exemplify my contention that chemistry remains in the forefront of scientific and technological advance and that its influence spreads ever wider and deeper over the whole field of science. More than that, the real economic strength of a country today can largely be gauged by the strength of its chemical industry.

But the fantastic pace of chemical progress and the vast increase in the scale of chemical activity during this century and especially during the past 25 years or so have brought in their train many serious problems for the chemists themselves. And today in an international gathering such as this it will not be inappropriate if I dwell a little on one such problem which is becoming one of the greatest urgency and which if it is not solved may in due course slow down the progress of chemistry and could indeed stultify it. This is the problem of communication. It is not, of course, a problem confined to chemistry for it applies to all science today; but it has existed for a longer time and is, because of the size and complexity of the subject, perhaps more acute in chemistry. Indeed, it was undoubtedly one of the factors that influenced our predecessors in founding IUPAC and the Union has always been in a measure concerned with it.

Time was when individual chemists were broadly aware of developments over the whole of the science. True the division of chemistry into organic, inorganic, physical and analytical sections is of very long standing, but specialists in any one of these used to be on familiar terms with the others. But that time has long passed thanks mainly to the explosive growth of our science during the past 50 years and the fantastic increase in factual knowledge that has accompanied it. The practitioners of the various branches have drawn more and more apart with the passage of time and only a few years ago the average organic chemist's knowledge and familiarity with, say, physical chemistry effectively terminated at the undergraduate level. But within chemistry, just as in science as a whole, most of the major developments are now occurring in the borderland areas between the traditional divisions and we can therefore no longer live happily segregated if we are to progress further. This, of course, poses a real problem in the education of the chemist. The plain truth is that we must rethink the whole matter of training courses and the traditional divisions of the science on which our university and college courses have been based. This is no easy matter I know, but we must all apply ourselves to it and to the related problem of the ancillary subjects of study, for chemistry is also advancing in the borderlands between it and, for example, the biological sciences. It is difficult to imagine any way in which an undergraduate today can, in the time normally available for university courses, hope to achieve the level of specialised knowledge reached by his counterpart in earlier generations, and unless we are to accept a still further fragmentation of chemistry with all its attendant disadvantages it seems as though specialised knowledge will have to be acquired later. There has been much talk in recent years of the gulf between the scientist and his colleague in the humanities. Such a gulf insofar as it exists is a bad thing, but far worse from the standpoint of scientific progress is a gulf between the practitioners of one branch of chemistry and their colleagues in others.

The development of such a gulf could be avoided if the professional chemist could read the literature dealing with branches of the subject other than those in which he himself works. But this is nowadays well-nigh impossible. Even within his branch he is unable to keep pace with the flood

of original literature. I recall making a calculation a few years ago on the amount of time an organic chemist would have to spend in order to read the original literature being published in organic chemistry alone. I do not now have the detailed figures to hand but roughly speaking they indicated that even if he did nothing but read it would have taken him a year and a half to read all that was published in 1959. Such then is the magnitude of the problem we face with regard to the literature of chemistry, and I believe it to be perhaps the most urgent of all the problems we have to solve.

Now, of course, many will argue that the answer to the problem is to be found in the review journal. Such review journals are increasing in number and are immensely valuable. We all use them in the hope of keeping in touch with progress in fields related to our special interests. But I wonder at times if we always take their compilation seriously enough. We have all, from time to time, found ourselves astonished at the inaccuracy or false bias of some review articles dealing with topics on which we ourselves are (or believe ourselves to be) expert. This is bound to make one a little uncertain at times whether on reading a review on some less familiar topic one is being informed or misinformed. Reviews which are not at once objective and accurate are dangerous at a time when so many chemists are driven to rely on them, and I believe a much greater scrutiny of review articles before publication is called for.

But for research purposes review articles cannot be a substitute for original papers, and yet the enormous and ever-increasing number of these has swollen our traditional journals out of all recognition, has led to the appearance of more and more new journals and is gradually overwhelming their publishers as it has already overwhelmed their readers. The great abstract journals, Chemical Abstracts, Chemisches Zentralblatt and the Referativny Jurnal, have struggled manfully with the problem of providing chemists with a précis of original papers, but it is getting beyond their power. It would be of great advantage to chemists if these three abstract journals would get together, pool their resources and give us one abstract journal which would impart speedy and reliable information on new work. But I fear that this would only be a temporary palliative. I believe the time has come for an all-out attack on this problem of the communication and retrieval of information, an attack in which we begin by discarding our preconceived ideas on the publication of chemical papers and adapt our way of doing things so that modern electronic techniques can play their full part in making new information readily and speedily available to all chemists on demand.

This is a field in which IUPAC has already been active. It had a Commission on Documentation just after the war and it has, through its Commission on Codification, produced a fully worked out notation and ciphering system capable of automation. This system is a step forward and I believe it should be put to use. I know that various ciphering systems have been developed and that there has been, and still is, dispute about their merits and demerits. But surely it is time that all the publishing bodies got together and agreed on one system. Do not let us add to existing chaos by having several different systems put into use at once. Let us also remember that time presses and that in this, as in many other matters, the best can sometimes be the enemy of the good. Briefly, then, I would appeal for a major attack on this problem of the chemical literature on a world-wide basis; on its solution depends the maintenance of progress in our science.

I have chosen to draw attention to this particular problem of communication not only because it is vital to the progress of pure chemistry, but also because it is economically important since chemical industry is equally concerned with it. And what better occasion could there be to do so than

this? For this is a Congress of Pure and Applied Chemistry and the sponsor is the International Union of Pure and Applied Chemistry. It is to my mind one of the glories of chemistry and one of its major sources of strength that the pure and the applied, the academic and the industrial aspects of it have grown up side by side in intimate contact, each drawing inspiration from the other and each contributing to the forward march of the science. This community of interest is something that must be preserved and strengthened, something which can serve as a model to other less fortunate sciences in their relations with industry.

Intimate contact between the academic and industrial aspects has been an especially marked feature of organic chemistry, a branch of the subject which is my own special interest and which is the major subject of the Congress. I need not enter into the historical reasons for this, but in many respects the quickening pace of advance has brought pure and applied organic chemistry even closer together in the sense that the gap between discovery and exploitation has greatly narrowed in recent years. But there are some features of modern organic chemistry as pursued in universities that give cause for thought in this connexion. One of the most striking developments in recent years has been the increasing use of physical methods and instruments as tools in the structural elucidation of complex organic compounds of natural origin and in the study of theoretical organic chemistry—X-ray diffraction, infrared, nuclear magnetic resonance, electron-spin resonance and mass spectrometry. These methods are rapidly replacing the older arts of chemical degradation, and are of enormous assistance in research. But occasionally one encounters in young research workers a tendency to assume that these techniques are about to displace the experimental organic chemical methods entirely. It would to my mind be disastrous if this kind of attitude led to a further weakening of the teaching of experimental organic chemistry. For synthesis is and must remain the essence of industrial chemistry and it is absolutely essential to industry, not only that those who enter it should be experimentally competent, but that the steady progress of experimental studies in the universities should continue to extend our armoury of reactions and manipulative techniques.

During this century the study of natural products has become a dominant feature of academic organic chemistry and much of the research in this field has been essentially concerned with the determination of molecular structure. So much so that not a few chemists have tended to forget that mere structural elucidation of a natural product is not the be-all and end-all of organic chemistry. If it were, the appearance on the scene of some of the new and powerful physical techniques we know now and others which will doubtless be introduced, might sound the death-knell of the subject. But, in fact, a knowledge of the molecular structure of a naturally occurring compound is only a first step which enables one to move forward to consider its function, its relationship to other accompanying substances, its origin and in due course by synthesis to prepare related materials which will throw light on vital processes or may be used to adapt or control them. The organic chemist then must welcome the new physical methods, as he has all their predecessors, as tools to speed up structural work and give him the opportunity of driving his subject further and deeper towards our understanding of nature. The vistas before him are wide and exciting and they are also practically important because we now stand at the opening of a phase in which increasing knowledge of the chemistry of animate matter may give us the key to safe control and manipulation of our environment. Even more, we may be approaching a time when the control of the human race not only in number but even, through chemical genetics, in type, could become a reality.

That is, of course, looking a very long way ahead but it does underline the pace of development in chemistry and in science as a whole that one can even speculate reasonably about such things. And this brings me to my final and rather general reflections. The picture of chemistry as a rapidly advancing subject is paralleled in most branches of natural science and our Union is but one of a substantial group of International Unions which are constituents of the International Council of Scientific Unions. ICSU and the individual Unions are all non-governmental associations of scientists and they have, I believe, a major rôle to play in the modern world. We live in difficult and exciting times, for I believe that the world is in the throes of a social revolution. And I believe too that it is the enormous rate of scientific and technological advance that has brought this about. Science and technology can advance very rapidly but social systems and attitudes change very much more slowly. Most of the strains and stresses in the world today can be traced back to this difference in rate and they are occasioned by the efforts of society to adapt itself to the fantastic changes in the material aspects of civilisation brought about by scientific advance. The various "isms" under which we function, capitalism, communism, socialism, etc., are all manifestations of such efforts and all are still evolving. Moreover the great and growing problem of the so-called underdeveloped countries is in a sense exaggerated by the growth of science since this tends to increase the gap between the developed and the underdeveloped. The tendency today is towards the coalescence of national sovereign states into larger groups, at least in the more highly developed areas of the world, and this it seems to me must further extend and lead ultimately to some kind of world government. But individual human societies be they nations, empires or unions of states exist only where there is some cement to hold them together —it may be language and culture, military might, or religion—and in the past their collapse has usually been due to military defeat or perhaps more fundamentally to the disintegration of the unifying force. Many examples to illustrate this thesis could be quoted. At the present time it is, as I have indicated, scientific and technological progress which is forcing change on our social and political systems. But science is equally the potential cement which will bind together the new units of society which must emerge. Here is at once a challenge and an opportunity for scientists, chemists as well as all the others. For we are people with a community of interest and knowledge which transcends national boundaries and we have a clear and evident basis for contact and mutual understanding. Herein lies part of the importance of such a Congress as this. Not only does it provide a means of exchanging technical information, but it provides a forum where men and women of like minds can meet and realise that their similarities are much greater than their differences and as a result may be able the better to play their parts not just as professional chemists, but as those whose function it also is to influence the political powers towards a rational utilisation of scientific advances in the interest of mankind as a whole.

FINANCIAL QUESTIONS OF IUPAC

Free translation of a Talk given by the Secretary General *at the Open Meeting of the Council in London, July 5, 1963.*

At the request of our distinguished President Prof. NOYES, I have the great privilege to convey to you some information on IUPAC Finances. Our Hon. Treasurer, Sir CHARLES DODDS, being prevented from attending this meeting today because of his heavy commitments, has passed on to me this pleasant task of conveying to you the very favourable financial situation. Whereas, two years ago, at the Montreal Conference the Treasurer had to present a Biennial Financial Report with an over-spending and deficit to the extent of US$15427.44. I am now in the fortunate position to show not only a balanced biennial account but to tell you that in the last two years the income has risen faster than the expenditure. This is a surprise in every respect, because in a careful budget for the conference year 1961, as was pointed out by Prof. NOYES in his speech on "the State of the Union" in Montreal, the Executive Committee was prepared to run a deficit of up to $100000.—. This deficit did not occur because of two reasons. On the income side, due to the recommendations made by the two Finance Committees—presided over by our distinguished Past President Prof. A. TISELIUS from Sweden and Prof. BAILAR from USA respectively—many adhering organizations at once started to increase their annual subventions considerably. As an example our German colleagues already in 1960, increased their annual subvention to $5000.—. This generous gesture had a catalysing effect. The Royal Society increased its annual subvention to IUPAC to $10000.— and in addition in an appeal to the British Industry, our British colleagues were able to contribute in a 7-year covenant substantial voluntary contributions. These two examples were followed by most of the other adhering organizations. Were currency restrictions or budgetary procedure prevented a similar generosity, the adhering organizations took over the charge of paying partly or in full the travel costs of their titular members and in this way helped the IUPAC Treasury.

The total income for the two years 1961/62 was therefore double of that for 1959/60. This fortunate situation—that the annual subvention increased so rapidly—is not only a sign of confidence in the Treasurer but it will encourage all IUPAC members to make additional efforts.

On the expenditure side, we also have been surprised during the last two years. Expense figures did not reach the high level anticipated and budgeted. There are various reasons for this. Our Canadian hosts invited many distinguished Titular Members from overseas and paid their full travel and livings costs for the Montreal Congress. British, French, German and USSR titular members were partly paid for by their national body. Attention was drawn to the fact that travel by air is one of the most important expenditure item of IUPAC. For the Montreal Congress, for the first time a charter flight was organized by the Secretary General. This charter flight was an extremely good success in every respect and the savings made were a few thousand dollars as mentioned already in the Treasurer's Report. The Nomenclature Commission was invited, at the expense of the US Government, to hold its conference meeting in the Headquarters of the Chemical Abstracts, Columbus, Ohio. Finally, a very remarkable sum was saved—and this is not to be considered favourable or encouraging—by titular members who did not attend meetings. At the very end, there were also savings which were wanted specially in view of the anticipated heavy deficit. Many Divisions and Commissions were not allowed to meet in Montreal. They either did not meet at

all or met at a place in Europe which would be cheaper with regard to travel. All these voluntary or unexpected savings amounted to a respectable sum of $80000.—. If we consider the greatly increased income and the reduced expenditure, it is not very surprising that the Biennial Account did not show the expected and budgeted deficit.

In 1962, which was a non-conference year, IUPAC expenses reached an overall high figure. This was mainly due to the first attempt towards worldwide activity which certainly is included in the aims of IUPAC. We sponsored the Symposium on Spectroscopy in Tokyo and held meetings of the Spectroscopy Commission and of the Executive Committee at the same time. This is only a very modest attempt towards stimulating activity in the distant countries, but produced, modest as it was, a disastrous effect on the finances of the Union. Not only did we pay the travel of so many American and European chemists to Tokyo but as a result of the greatly stimulating effect of our activity in the Far East, we will have many more Japanese Titular Members within IUPAC. This is of course highly desirable and is a sign of real international co-operation, but the financial consequences are such that we are already now at the very limit of our possibilities. Economy class return fare from Europe to Japan costs some $1300.— and it is easy to calculate how much a vote or a word of a European in Japan or a Japanese in Europe could cost. At this moment, it might be interesting to say a few words about the influence of air traffic on our finances. Modern air traffic makes it technically very easy to establish contact all over the world but this technical possibility must be paid for. Expenses for travel have thus increased to the factor of 1 to 5 or even 1 to 10.

There is another peculiarity about IUPAC finances which is also quite different from other organizations. The financial problems will never be solved because as more money is available the rate of activity rises and expenses involved increase. As an example, I would like to mention that in the beginning of IUPAC activity, no travel and subsistence was paid. This resulted in only a special class of travelling chemists who could afford to attend the IUPAC meetings. This of course was completely wrong. Gradually, a part of the travel costs were met by IUPAC but this had a very great drawback and led to situations which were not dignified for scientists. They had, in order to meet their colleagues at the IUPAC Conference or Congress, to hunt for money from various sources. This of course was reflected back on IUPAC which itself got into trouble when the central IUPAC Treasury was asking for money. The only fair and dignified solution would be that IUPAC finances be such that full travel and full subsistence be paid to all Titular Members.

A word must also be said with regard to the administration costs. These costs are still negligible or non-existant because IUPAC officers are serving in a honorary capacity. This is an especially heavy burden for the Division Presidents who have not the appropriate clerical staff. It is without doubt urgently necessary for an improvement in this respect. The financial outlook into the future should be reflected in the budget, but here we have an extremely difficult situation, because nobody can tell two years in advance how an IUPAC meeting will be attended. For the subjects to be dealt with will always attract more or less people. For Organic or Biological Chemistry there will usually be a greater number of participants. If Inorganic Chemistry or Theoretical Chemists is the subject, the number of chemists to be expected is usually much lower. So far, it is felt that scientific meetings should not be held during the tourist season and should never be held in places of tourist interest.

A very important and extremely serious question must be solved in the near future. Hitherto, all the work done in the field of Nomenclature,

Symbols, Units, Abbreviations, etc., has been done without remuneration. It is not possible to ask Scientists to sacrifice so much of their valuable time and there is a limit to what can be asked of a man when there is no other reward that of high appreciation by his colleagues.

As Prof. NOYES pointed out two years ago, it is the duty of IUPAC to stimulate chemical activity all over the world. This will of course be a more costly affair. We must first show positive results before we can ask for more money. There are many different sources to be tapped and this varies from country to country. Our American colleagues have with great success interested a number of individual chemists who make contributions to IUPAC and by doing so have started thinking internationally. In some countries attempts have been made to interest Chemical Industries, whereas in many other countries there is only the Government who is on a position to make financial contributions to international organizations.

Coming to an end, it is my duty and my pleasure to express our sincere indebtedness to the National Adhering Organizations who have contributed to our activity in a very generous manner. Thanks must also be expressed in particular to the Royal Society who has helped the Treasurer in his business, UNESCO and ICSU for their annual subvention and finally to the Union Bank of Switzerland who handles the IUPAC account without charging the Union.

PROGRAMME OF CONGRESS LECTURES

Organic Chemistry

Thursday, July 11, Odeon Cinema, Leicester Square

9.45 a.m. "The Structure of Carbanions" by Prof. D.J. CRAM, Los Angeles, California (USA)
Chairman: Prof. D.H.R. BARTON (England)
Vice-Chairman: Dr. C.A. BUNTON (England)

11.00 a.m. "Small Rings Containing Carbon-Carbon Triple Bonds-Compounds for which there is circumstantial evidence" by Professor G. WITTIG, Heidelberg (Germany)
Chairman: Prof. H.G.H. ERDTMAN (Sweden)
Vice-Chairman: Dr.R.S. CAHN (England)

Friday, July 12, Odeon Cinema, Leicester Square

9.45 a.m. "Equilibration and Vapour Phase Halogenation of Benzene Derivatives" by Prof. E.C. KOOYMAN, Leiden (Netherlands)
Chairman: Prof. A. FREDGA (Sweden)
Vice-Chairman: Prof. D.H. HEY (England)

11.00 a.m. "Rearrangements of Free Alkyl Radicals and of Alkyl Cations in Solutions" by Prof. O.A. REUTOV, Moscow (USSR)
Chairman: Prof. A. KERGOMARD (France)
Vice-Chairman: Sir CHRISTOPHER INGOLD (England)

Monday, July 15, Odeon Cinema, Leicester Square

9.45 a.m. "Isothiocyanates of Natural Derivation" by Prof A. KJÆR, Copenhagen (Denmark)
Chairman: Prof. B.M. MIKHAILOV (USSR)
Vice-Chairman: Prof. W. KLYNE (England)

11.00 a.m. "Structural Studies on Biologically Active Microbial Metabolites" by Prof. E. LEDERER, Gif-sur-Yvette (France)
Chairman: Prof. M. MOUSSERON (France)
Vice-Chairman: Prof. W.T.J. MORGAN (England)

Tuesday, July 16, Odeon Cinema, Leicester Square

9.45 a.m. "The Use of the Schmidt Reaction in the Elaboration of Selected Alkaloids containing a Seven-membered Ring" by Prof. S. UYEO, Kyoto (Japan)
Chairman: Prof. R. ADAMS (USA)
Vice-Chairman: Dr. H.T. OPENSHAW (England)

11.00 a.m. "The Structure, Stereochemistry, and Absolute Configuration of Anhydroryanodine" by Prof. K. WIESNER, Fredericton, New Brunswick (Canada)
Chairman: Prof. G. FODOR (Hungary)
Vice-Chairman: Prof. A.R. BATTERSBY (England)

Wednesday, July 17, Odeon Cinema, Leicester Square

9.45 a.m. "Studies on the Synthesis of Corrins" by Prof. A. ESCHENMOSER, Zürich (Switzerland)
Chairman: Prof. T.R. SESHADRI (India)
Vice-Chairman: Dr. B.A. HEMS (England)

11.00 a.m. "Recent Studies on the Synthesis of Homocyclic Systems" by Prof. W.S. JOHNSON, Stanford, California (USA)
Chairman: Lord TODD (England)
Vice-Chairman: Prof. D.H.R. BARTON (England)

Astoria Cinema, Charing Cross Road

9.45 a.m. "Organic Chemistry in Peptide Synthesis" by Dr. J. RUDINGER, Prague (Czechoslovakia)
Chairman: Prof. F. WEYGAND (Germany)
Vice-Chairman: Dr. G.T. YOUNG (England)

11.00 a.m. "Recent Advances in the Chemistry of Large-ring Conjugated Systems" by Prof. F. SONDHEIMER, Rehovoth (Israel)
Chairman: Prof. E.R.H. JONES (England)
Vice-Chairman: Prof. B.C.L. WEEDON (England)

Inorganic Chemistry

Thursday, July 11, Astoria Cinema, Charing Cross Road

9.45 a.m. "Recent Progress in the High Temperature Chemistry of Inorganic Salt Systems" by Prof. H. BLOOM, Hobart, (Tasmania)
Chairman: Prof. H. FLOOD (Norway)
Vice-Chairman: Prof. C.C. ADDISON (England)

11.00 a.m. "Electron-transport Properties of Group VIB Compounds" (Joint meeting with Applied Chemistry Division.) By Dr. R.R. HEIKES, Pittsburgh, Pennsylvania (USA)
Chairman: Dr. F.A. KRÖGER (Netherlands)
Vice-Chairman: Dr. J.H. BUSHILL (England)

Analytical Chemistry

Friday, July 12, Astoria Cinema, Charing Cross Road

9.45 a.m. "Variation of the Half-wave Potential of Organic Compounds with pH" by Prof. P.J. ELVING, Ann Arbor, Michigan (USA)
Chairman: Prof. W. KEMULA (Poland)
Vice-Chairman: Dr. A.J. AMOS (England)

Monday, July 15, Astoria Cinema, Charing Cross Road

9.45 a.m. "Modern Problems in the Determination of Trace Elements in Pure Compounds" by Prof. I.P. ALIMARIN, Moscow (USSR)
Chairman: Prof. P. WEST (USA)
Vice-Chairman: Mr. R.C. CHIRNSIDE (England)

11.00 a.m. "Masking and Promotion of Reactions in Quantitative Analysis" by Prof. A. RINGBOM, Abo (Finland)
Chairman: Prof. G. CHARLOT (France)
Vice-Chairman: Dr. D.W. KENT-JONES (England)

Applied Chemistry

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11.00 a.m. "Electron-transport Properties of Group VIB Compounds" (Joint Meeting with Inorganic Chemistry Division) by Dr. R.R. HEIKES, Pittsburgh, Pennsylvania (USA)
Chairman: Dr. F.A. KROGER (Netherlands)
Vice-Chairman: Dr. J.H. BUSHILL (England)

Friday, July 12, Astoria Cinema, Charing Cross Road

11.00 a.m. "Design of Automatic Control Systems for the Process Industry" by Mr. H. SANDVOLD, Oslo (Norway)
Chairman: Prof. H. MALISSA (Austria)
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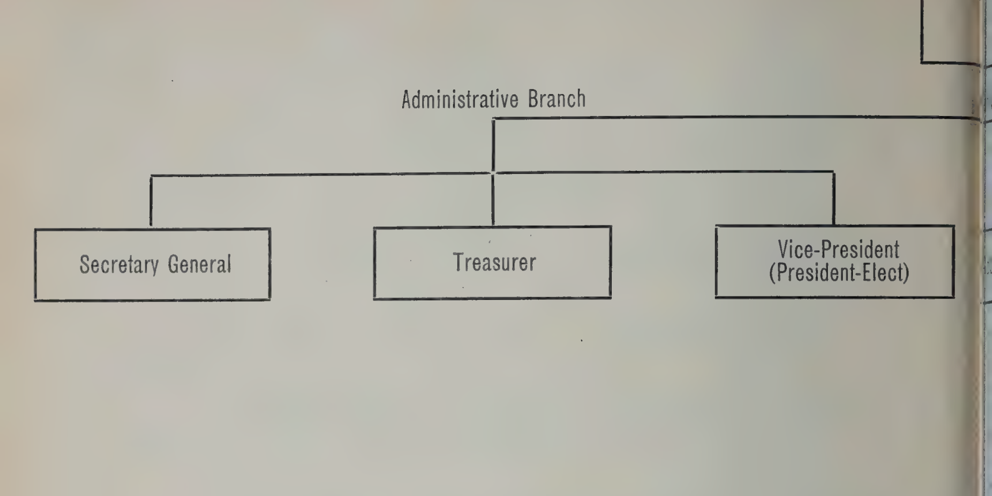
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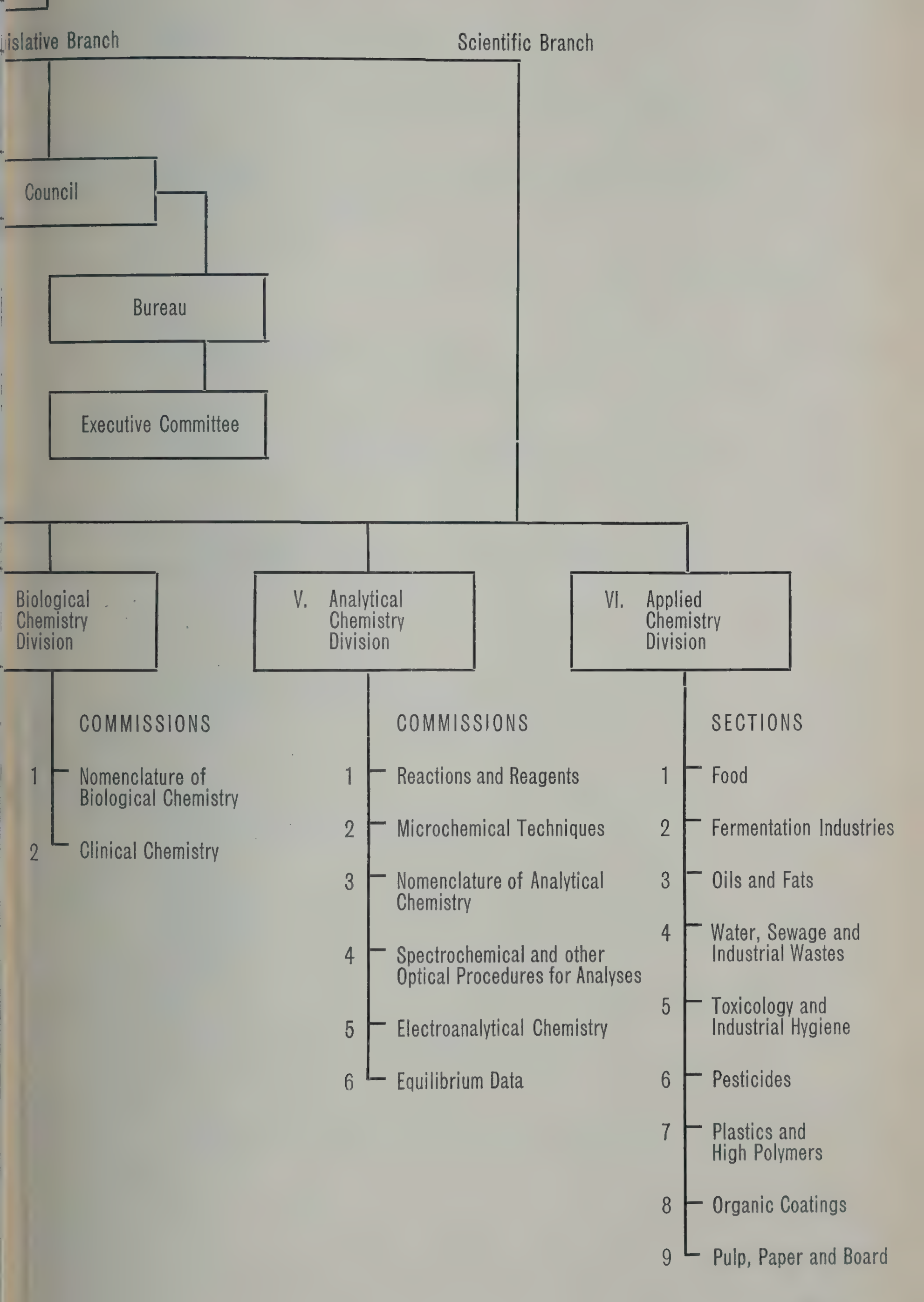
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Sous-Commission: Symboles et Terminologie électrochimiques

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Commission: Chimie macromoléculaire

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Commission: Données et Étalons physico-chimiques

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Commission: Structure moléculaire et Spectroscopie

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Sous-Commission: Étalons de Nombres d'Ondes infrarouges

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Sous-Commission: Étalons d'Intensité infrarouges

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Sous-Commission: Spectroscopie ultraviolette

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Sous-Commission: Unités et Terminologie

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Commission: Chimie des Colloïdes et des Surfaces

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Commission mixte: Radio-activité appliquée

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Tchécoslovaquie	HEYROVSKY, J., Prof., Polarographic Institute of the Czechoslovak Academy of Sciences, Vlasská 9, Prague
Turquie	BERKEM, A.R., Prof., Fen Fakültesi, Istanbul
URSS	FROUMKINE, A.N., Prof. Institut d'Electrochimie de l'Académie des Sciences de l'URSS 31, Leninskiiprospect, Moscou 71
Yougoslavie	KARSULIN, M., Prof., Institute of Physical Chemistry, Technological Department of the University 20, Marulicev trg., Zagreb

II INORGANIC CHEMISTRY DIVISION
DIVISION DE CHIMIE INORGANIQUE

Division Committee / Comité de Division

Titular Members

President

1963–1967 de Boer, J.H., Prof., Scientific Council for Nuclear Affairs
Duinweg 24, The Hague (Netherlands), Tel. 070-51 22 61

Past-President

1963–1967 Emeléus, H.J., Prof., University Chemical Laboratory
Lensfield Road, Cambridge (England), Tel. 56491

Vice-President

1963–1967 Benard, J., Prof., Ecole nationale supérieure de Chimie
11, rue Pierre-Curie, Paris-5e (France), ODÉon 01-38

Secretary

1959–1967 Gutmann, V., Prof., Technische Hochschule
Getreidemarkt 9, Vienna VI (Austria), Tel. 57 16 56/217

Members

1963–1967 Anderson, J.S., FRS, Dr., National Chemical Laboratory
Teddington, Middlesex (England)

1963–1967 Caglioti, V., Prof.
Istituto di Chimica Generale e Inorganica, Università di Roma
Rome (Italy)

1963–1967 Glemser, O., Prof.
Institut für Anorganische Chemie, Universität Göttingen
Göttingen (Germany)

1963–1967 Parry, R.W., Prof.,
Department of Chemistry, University of Michigan
Ann Arbour, Mich. (USA)

1963–1967 Schwarzenbach, G., Prof., Eidg. Technische Hochschule
Zürich (Switzerland)

1963–1967 Spitzyn, V.I., Prof., Academy of Science
Moscow (USSR)

1963–1967 Trzbiatowska, B.J., (Mrs.) Prof, University of Wroclaw
(Poland)

II.1 Commission: Atomic Weights
Commission: Poids atomiques

Titular Members

Chairman

1963–1967 Wichers, E., Dr., National Academy of Sciences,
Division of Chemistry and Chemical Technology
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Tel. EXecutive 3-8100

Vice-Chairman

1963–1967 Ölander, A., Prof., University of Stockholm
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Secretary

1959–1967 Guéron, J., EURATOM
51, rue Belliard, Brussels 5 (Belgium), Tel. 144090/294

Members

1959–1967 Cameron, A.E., Dr., Oak Ridge National Laboratory
P.O.B. Y, Oak Ridge, Tenn. (USA)

1963–1967 Greenwood, N.N., Prof.
Department of Chemistry, University of New Caste-on-Tyne
New Castle-on-Tyne (England)

1959–1967 Remy, H., Prof., Chemisches Staatsinstitut
Jungiusstrasse 7–9, Hamburg 36 (Germany)

1963–1967 Thode, H.G., Prof., McMaster University
Hamilton, Ontario (Canada)

1963–1967 Wapstra, A.H., Prof., Institut voor Kernenergie Onderzoek
Oosterringdyk 18, Amsterdam (Netherlands)

Associate Members

Batuecas, T., Prof., Faculté des Sciences, Université
Santiago de Compostela (Spain)

Mattauch, J., Prof., Max-Planck-Institut für Chemie
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Spaepen, J., Dr., Euratom Bureau of Nuclear Measurements
Steenweg op Retie, Geel (Belgium)

II.2 Commission: Nomenclature of Inorganic Chemistry
Commission: Nomenclature de Chimie inorganique

Titular Members

Chairman

1959–1965 Jensen, K.A., Prof., The H.C. Ørsted Institute
5, Universitetsparken, Copenhagen Ø (Denmark)

Honorary-Chairman

1959–1965 Bassett, H., Hon. Prof.
282 Wokingham Road, Reading, Berks. (England)

Vice-Chairman

1959–1965 Remy, H., Prof., Chemisches Staatsinstitut
Jungiusstrasse 9, Hamburg 36 (Germany)

Secretaries

1959–1965 Gallais, F., Prof., Ecole nationale supérieure de Chimie
38, rue des 36-Ponts, Toulouse (France)

1963–1965 Prue, J.E., Dr., Department of Chemistry, The University
Reading, Berks. (England)

Members

1963–1965 CHATT, J., Dr., Agricultural Research Council
15 Regent Street, London S.W.1 (England)

1959–1965 CHEESMAN, G.H., Dr.
Chemistry Department, University of Tasmania
Box 647c, G.P.O. Hobart, Tasmania (Australia)

1963–1965 FERNELIUS, W.C., Dr., Research Centre, Koppers Co. Inc.
Monroeville, Pa. (USA)

1959–1965 MALATESTA, L., Prof.
Istituto di Chimica Generale dell'Università
Via Cesare Saldini 50, Milan (Italy)

1959–1965 ÖLANDER, A., Prof., University of Stockholm
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Associate Members

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Observer from III.1

VEIBEL, E., Prof.
83 Solvgade, Copenhagen K (Denmark)

II.3 Commission: High Temperatures and Refractories
Commission: Hautes Températures et Réfractaires

II.3.1 Sub-Commission: Condensed States
Sous-Commission: États condensés

Titular Members

Chairman

1957–1965 CHAUDRON, G., Prof.
11, rue Pierre-Curie, Paris-5e (France), Tel. ODÉon 45-46

Secretary

1957–1965 FOEX, M., Dr., Laboratoire de l'Energie solaire
Mont-Louis, Pyrénées-Orientales (France), Tel. 35 à Mont Louis

Members

1961–1965 Flood, H., Prof., Institute for Silikatforskning
Trondheim (Norway)

1959–1965 Franklin, A.D., Dr., National Bureau of Standards
Washington 25, D.C. (USA)

1961–1965 Nowotny, H., Prof.
Tulpengasse 2, Vienna 8 (Austria)

1957–1965 Trombe, F., Prof., Laboratoire du CNRS
1, place Aristide-Briand, Bellevue, Seine-et-Oise (France)

Associate Members

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Bright, N.F.H., Dr.
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Dietzel, A., Prof., Max-Planck-Institut
Würzburg (Germany)

Ram, A., Dr., Central Glass and Ceramic Research Institute
Hirate Machi, Kita Ku, Nagoya (Japan)

Rieck, G.D., Dr., Technische Hochschule Eindhoven
P.O.B. 313, Eindhoven (Netherlands)

Shaw, J.P.M., Dr., ICI Ltd.
General Chemical Division, Widnes Laboratory
Widnes, Lancs. (England)

Thakur, R.L., Dr., Central Glass and Ceramic Research Institute
Calcutta (India)

Walker, R.F., Dr., Gonville and Caius College
Cambridge (England)

White, J., Prof., Department of Metallurgy
University of Sheffield (England)

II.3.2 Sub-Commission: Gaseous States
Sous-Commission: Gaz

Titular Members

Chairman

1963–1965 Lewis, B., Dr., 1007 Oliver Building
Pittsburgh Pennsylvania (USA)

Vice-Chairman

1963–1965 Thring, M.W., Prof., Sheffield University
Sheffield (England)

Secretary

1963–1965 Starkman, E., Prof., University of California,
College of Engineering Aeronautical Sciences
Berkeley 4, California (USA)

Members

1963–1965 Deffet, L., Dr.
Centre de Recherches pour l'Industrie des Explosifs
Val du Bois, Sterrebeek, Brabant (Belgium)

1963–1965 Lochte-Holtgreven, W., Prof.
University, Experimental Physics Institute
Kiel (Germany)

1963–1965 Wagner, G.G., Prof., Institut für physikalische Chemie,
Universität, Göttingen (Germany)

II.4 Commission: Geochemistry
Commission: Géochimie

(will be a Joint Commission IUPAC/IUGS – subject to the decision of the Bureau)

Titular Members

Chairman

1963–1965 Vinogradov, A.P., Academician,
Vemadsky Institute of Geochemistry, Academy of Sciences
Moscow V-13 (USSR)

Vice-Chairman

1963–1965 Ingerson, Earl, Prof., University of Texas
Austin 12, Texas (USA)

Secretary

1963–1965 Ahrens, L.H., Prof.
Department of Geochemistry, University of Cape Town
Rondebosch, Cape Province (Republic of South Africa)

Members

1963–1965 Fornaseri, M., Prof., Istituto de Geochimica,
Università di Roma, Via di Villa Ada 10R, Roma (Italia)

1961–1965 Landergren, S., Prof., The Marine Laboratory
1 Rickenbacker Causeway, Miami 49, Florida (USA)

1961–1965 Smales, A.A., Dr., Analytical Chemistry Branch,
Atomic Energy Research Establishment
Harwell, Berks (England)

1963–1965 Sugawara, K., Prof., Chemical Institute,
Faculty of Science, Nagoya University
Chikusa-Ku, Nagoya (Japan)

1963–1965 Thompson, J.B., Prof.
Department of Mineralogy and Petrography,
Harvard University, Cambridge 38, Mass. (USA)

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Richard Zsigmondyweg 9, Göttingen (Germany)

SANDELL, E.B., Prof.
4424 Victory Avenue, Minneapolis 12, Minn. (USA)

TOMKEIEFF, S.I., Prof., Geology Department,
King's College, University of Durham
Newcastle-on-Tyne (England)

III. ORGANIC CHEMISTRY DIVISION
DIVISION DE CHIMIE ORGANIQUE

Division Committee / Comité de Division

Titular Members

President

1963–1965 Marion, L., Prof.
National Research Council, Division of Pure Chemistry
Ottawa 2 (Canada)

Past-President

1963–1965 Erdtman, H., Prof., Royal Institute of Technology
Stockholm 70 (Sweden)

Vice-President

1963–1965 Weygand, F., Prof., Technische Hochschule
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Secretary

1961–1965 Urbanski, T., Prof., Ecole polytechnique
75, rue Koszykowa, Warsaw (Poland)

Members

1963–1967 Bartlett, P.D., Prof.
288, Concord Road Weston 93, Mass. (USA)

1963–1967 Barton, D.H.R., Prof., Imperial College of Science
Imperial Institute Road, London S.W.7 (England)

1962–1966 Kjaer, A., Prof.
Department of Organic Chemistry, Den Kgl.
Veterinaer- og Landbohojskole
Bülowsvej 13, Copenhagen V (Denmark)

1961–1965 Nakanishi, K., Prof., Tokyo Kyoiku University
Otsuka, Bunkyo, Tokyo (Japan)

1961–1965 Ourisson, G., Prof.
Université de Strasbourg (France)

1963–1967 Reutov, O.A., Prof., Moscow University
Gorki Street 19, app. 72, Moscow (USSR)

III.1 Commission: Nomenclature of Organic Chemistry
Commission: Nomenclature de Chimie organique

Titular Members

Chairman

1963–1967 VERKADE, P.E., Prof.
Ary Schefferstraat 217, 's-Gravenhage (Netherlands)

Secretary

1963–1967 NUTTING, H.S., Dr., The Dow Chemical Company
Midland, Michigan (USA)

Members

1963–1967 CAHN, R.S., Dr., The Chemical Society
20–21, Cornwall Terrace, Regent's Park, London N.W.1 (England)

1963–1967 CAPELL, L.T., Dr.
The Chemical Abstracts Service, The Ohio State University
Columbus 10, Ohio (USA)

1963–1967 DYSON, G.M., Dr.
Chemical Abstracts Service, The Ohio State University
Columbus 10, Ohio (USA)

1963–1967 KERSAINT, G., Dr.
250, rue St-Jacques, Paris-5e (France)

1963–1967 LOZAC'H, N., Prof., Laboratoire de Chimie, Nouvelle Université
Caen, Calvados (France)

1963–1967 VEIBEL, S., Prof., Department of Organic Chemistry
Technical University of Denmark
Solvgade 83, Copenhagen K (Denmark)

Associate Members

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Editorial Office of the Chemical Society
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Chemical Abstracts Service, The Ohio State University
Columbus 10, Ohio (USA)

IV. BIOLOGICAL CHEMISTRY DIVISION
DIVISION DE CHIMIE BIOLOGIQUE

Division Committee / Comité de Division

IV.1 Joint Commission: Nomenclature of Biological Chemistry
Commission mixte: Nomenclature de Chimie biologique

Titular Members

Chairman

IUPAC 1959–1967	KLYNE, W., Prof., Westfield College Chemistry Department, University of London London N.W.3 (England)

Secretary

IUB	SLATER, E.C., Prof., Laboratorium voor Physiologische Chemie Jonas Daniel Meijerplein 3, Amsterdam C (Netherlands)

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IUB	BRAUNSTEIN, A.E., Prof., Institute of Physico-Chemical and Radiation Biology, Academy of Sciences of the USSR 1 Academichesky Proyezd 18, Moscow B-342 (USSR)
IUPAC 1963–1967	COHN, W.E., Dr. Biology Division, Oak Ridge National Laboratory P.O. Box Y, Oak Ridge, Tenn. (USA)
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IUB	HOFFMANN-OSTENHOF, O., Prof., Organisch-Chemisches Institut Währingerstrasse 38, Wien IX (Austria)
IUPAC 1959–1967	KEIL, B., Dr., Czechoslovak Academy of Sciences Institute of Organic Chemistry and Biochemistry Na cvicišti 2, Praha 6 (Czechoslovakia)
IUB	LIÉBECQ, C., Prof. 87, av. de Péville, Grivegnée, Liège X (Belgium)
IUPAC 1959–1967	MALMSTRÖM, B., Dr., Department of Biochemistry University of Gothenburg, Gibraltargatan 5A Göteberg 5 (Sweden)
IUPAC 1959–1967	SCHWYZER, R. Prof., CIBA Ltd. Basle (Switzerland)

Corresponding Member

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IV.2 Commission: Clinical Chemistry
Commission: Chimie clinique

Titular Members

President

1963–1967 Courtois, J.E., Prof.
4, av. de l'Observatoire, Paris (France)

Secretary

1963–1967 Sanz, M.C., Dr., Centre de Chimie clinique
30, bd de la Cluse, Genève (Switzerland)

Membres

1959–1967 Orekhovitch, V.N., Prof.
Institute of Biology and Medicine Chemistry of the USSR
AMS Pogodin Street 10, Moscow (USSR)

1959–1967 Jackson, S.H., Dr. Hospital for Sick Children
555 University Avenue, Toronto 2, Ontario (Canada)

1959–1967 MacLagan N.F., Prof., Westminster Medical School
Horseferry Road, London S.W.1 (England)

1963–1967 Rubin, M., Dr.
Department of Biochemistry, Georgetown University Hospital,
Washington, D.C. 20037 (USA)

1963–1967 Ruyssen, R., Prof.
St. Jansvest 12, Ghent (Belgium)

1963–1967 de Wael J., Dr.
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National Representatives:

Australia Curnow, D.H., Dr.
Royal Perth Hospital, Perth

Czechoslovakia Horejsi, J. Prof.
Czechoslovakia Biochemical Society, U Nemocnice 5, Praha 2

Denmark Lous, P., Dr.
Department of Clinical Chemistry
Bispebjerg Hospital, Copenhagen N.V.

Germany Werle, E., Prof. Dr.
Klinisch-Chemisches Institut an der chirurgischen Universitätsklinik
Nussbaumstrasse 20, München

Iran Gaguik, H., Dr.
Prof. of Biochemistry, University of Teheran
Fleming Laboratory, Aziz Khan Square, Teheran

Japan Yamamura, Y., Prof.
3rd Dept. of Internal Medicine
Osaka University Hospital, Fukushima, Osaka

Norway Eldjarn, L., Prof. Dr. med.
Head of the Institute of Clinical Biochemistry
Rikshospitalet, Oslo

V. ANALYTICAL CHEMISTRY DIVISION
DIVISION DE CHIMIE ANALYTIQUE

Division Committee / Comité de Division

Titular Members

President

1961-1965 MALISSA, H., Prof., Technische Hochschule
Getreidemarkt 9, Vienna (Austria) Tel. 57 16 51 / 222,273

Vice-President

1963-1965 WEST, P.W., Prof.
Chemistry Department, Louisiana State University
Baton Rouge 3, Louisiana (USA)

Secretary

1961-1965 DEGENS, Jr., P.N., Dr.
Badhuisweg 3, Amsterdam (Netherlands) Tel. 61111 / 629

Members

1961–1965 DELAHAY, P., Prof.
Chemistry Department, Louisiana State University
Baton Rouge 3, Louisiana (USA)

1961–1965 FISCHER, W., Prof., Anorganisch-chemisches Institut
Callinstrasse 46, Hannover (Germany)

1963–1967 GAUTIER, J.A., Prof.
1, rue Cabanis, Paris-6e (France)

1961–1965 PŘIBIL, R., Prof
Londynska 56, Praha 2-Vinohrady (Czechoslovakia)

1963–1967 SMALES, A.A.,
Atomic Energy Research Establishment
Harwell, Didcot, Birkshire (England)

1961–1965 TANAKA, N., Prof., Department of Chemistry
Tohoku University, Sendai (Japan)

V.1 Commission: Reactions and Reagents
Commission: Réactions et Réactifs

Titular Members

Chairman

1961–1965 Veibel, S., Prof.
Den Polytekniske Leareanstalts Organisk-Kemiske Laboratorium
Sølvgade 83, Copenhagen (Denmark)

Secretary

1959–1967 Johnson, W.C., Hopkin & Williams Ltd.
Freshwater Road, Chadwell Heath, Essex (England)

Members

1961–1965 Feigl, F., Prof., Ministerio da Agricultura
Lab. Avenida Pasteur, 404, Rio de Janeiro (Brazil)

1961–1965 Jureček, M., Prof., School of Chemical Engineering
Pardubice (Czechoslovakia)

1961–1965 Mukherji, A.K., Prof.
Louisiana State University in New Orleans,
Department of Chemistry
Lake Front, New Orleans, La. (USA)

1961–1965 Pesez, M., Dr., Directeur de la Division analytique
Roussel-Uclaf, 102, route de Noisy, Romainville, Seine (France)

1962–1965 Sawicki, E., Dr.
Division of Air Pollution, Taft Sanitary Engineering Center
4676 Columbia Parkway, Cincinnati 26, Ohio (USA)

1963–1967 Stephen, W.I., Dr.
Department of Chemistry, University of Birmingham
Edgbaston, Birmingham 15 (England)

Associate Members

Anger, V., Dr.
Wallgasse 25, Vienna VI (Austria)

Goldstein, D., Dr.
Laboratorio da Proção Mineral, Ministerio da Agricultura
Avenida Pasteur, 404, Rio de Janeiro (Brazil)

Jart, A.
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Sølvgade 83, Copenhagen (Denmark)

Ma, T.S., Prof.
City University of N.Y., Brooklyn College
Brooklyn 10, New York (USA)

Welcher, F.J., Prof.
Indiana University, Department of University Extension
518 North Delawara Street, Indianapolis 4, Ind. (USA)

V.2 Commission: Microchemical Techniques
Commission: Techniques microchimiques

Titular Members

Chairman

1958–1965 Steyermark, A., Dr.
Microchem. Department, Hoffmann-La Roche Inc.
Roche Park, Nutley 10, N.J. (USA)

Secretary

1958–1967 Schöniger, W., Dr., Microanal. Department, Sandoz Ltd.
Basle 13 (Switzerland)

Members

1958–1965 Hölzel, S., Dipl. Chem., Österreichische Stickstoffwerke AG
Linz/Donau (Austria)

1958–1965 Körbl, J., Ing.
Research Institute of Pharmacy and Biochemistry
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1958–1965 Lévy, R., Dr.
Section de Microanalyse, Laboratoire municipal de Paris
39 *bis*, rue de Dantzig, Paris-15e (France)

Associate Members

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Institute of Elemental Organic Compounds, Academy of Science
Vorobievskoye shosse, Moscow (USSR)

Věčěra, M., Dr.
Vúos, Pardubice-Rybitvi (Czechoslovakia)

V.3 Commission: Analytical Nomenclature
Commission: Nomenclature analytique

Titular Members

Chairman

1963–1967 Belcher, R., Prof.
Department of Chemistry, University of Birmingham
Edgbaston, Birmingham (England)

Secretary

1961–1965 Ambrose, D., Dr., DSIR, National Chemical Laboratory
Teddington, Middlesex (England)

Members

1961–1965 Alimarin, J.P., Prof., V.I. Vernadsky Institute
of Geochemistry and Analytical Chemistry
Vorobievskoye shosse 47a, Moscow V-135 (USSR)

1961–1965 BAYER, E., Prof., Chem. Institut der Universität
Wilhelmstrasse 33, Tübingen (Germany)

1963–1967 FENNELL, R.W., Ministry of Aviation,
Chemistry Department, Royal Aircraft Establishment
Farnborough, Hants. (England)

1961–1965 SANDELL, E.B., Prof.
School of Chemistry, University of Minnesota
Minneapolis, 14, Minn. (USA)

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Callinstrasse 46, Hannover (Germany)

IRVING, H.M.N.H., Prof.
Department of Chemistry, The University of Leeds
Leeds (England)

WEST, T.S., Dr.
Chemistry Department, Imperial College of Science
South Kensington, London, S.W.7 (England)

V.4 Commission: Spectrochemical and other Optical Procedures for Analyses

Commission: Spectroanalyse et autres méthodes optiques d'Analyse

Titular Members

Chairman

1959–1965 MENZIES, A.C., Dr., Hilger & Watts Ltd.
98 St Pancras Way, Camden Road, London N.W. 1 (England)

Secretary

1959–1965 LOEUILLE, E., Dr., GAMS (LNE)
1, rue Gaston-Boissier, Paris-15e (France)

Members

1959–1967 FASSEL, V., Prof.
Iowa State University, Department of Chemistry
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1957–1965 KAISER, H., Prof.
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1959–1967 MANDELSTAM, S., Prof.
Moscow University, Lebeder Physical Institute
K 12 pr. Sapunova, Moscow 127 (USSR)

1961–1965 SALPETER, E.W., Dr.
Specola Vaticana, Laboratorio d'Astrofisico
Castel Gandolfo, Città del Vaticano (Italy)

1961–1965 SCRIBNER, B.F., Dr.
Division of Chemistry, National Bureau of Standards
Washington 25, D.C. (USA)

Associate Members

Birks, L.S., Dr., U.S. Naval Laboratory
Washington 25, D.C. (USA)

Guyer, H., Dr., Georg Fischer AG
Hombergstrasse 17, Schaffhausen (Switzerland)

Kortüm, G., Prof.,
Phys. Chem. Institut, Eberhardt-Karls-Universität
Wilhelmstrasse 33, Tübingen (Germany)

Svejda, H., Dr.
Cottagegasse 45/9, Wien XIX (Austria)

V.5 Commission: Electroanalytical Chemistry
Commission: Chimie électro-analytique

Titular Members

Chairman

1963–1965 Kolthoff, I.M., Prof.
School of Chemistry, University of Minnesota
Minneapolis 14, Minn. (USA)

Secretary

1963–1967 Robinson, R.A., Prof., National Bureau of Standards
Washington, D.C. 20234 (USA)

Members

1963–1967 Anson, F., Dr.
Dept. of Chemistry, California Institute of Technology
Pasadena, California (USA)

1961–1965 Badoz-Lambling, Mrs. J., Dr., Faculté des Sciences de Paris,
Laboratoire de Chimie analytique, E.P.C.I.
10, rue Vauquelin, Paris-5e (France)

1961–1965 Gerischer, H., Prof., Max-Planck-Institut
Stuttgart (Germany)

1959–1967 Kemula, W., Prof., Department of Chemistry
Pasteura 1, Warsaw 22 (Poland)

1963–1967 Vianello, E., Dr., Centro di Polarografia
Via Leonardo Loredan 4, Padova (Italy)

1963–1967 Zuman, P., Dr.
Polarographic Institute, Czechoslovak Academy of Science
Opletalova 25, Prague 1 (Czechoslovakia)

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DELAHAY, P., Prof.
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FLENGAS, S.N., Dr.
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Toronto (Canada)

HILLS, G.J., Prof., Department of Chemistry, The University
Southampton (England)

LAITINEN, H.A., Prof.
Department of Chemistry, University of Illinois
Urbana, Ill. (USA)

PERRIN, D.D., Dr., Department of Medical Chemistry
The John Curtin School of Medical Research,
The Australian National University
Canberra, A.C.T. (Australia)

TANAKA, N., Prof., Department of Chemistry, Tohoku University
Sendai (Japan)

Observers

BRUCKENSTEIN, S., Dr.
School of Chemistry, University of Minnesota
Minneapolis 14, Minnesota (USA)

COETZEE, J.F., Dr.
Department of Chemistry, University of Pittsburgh
Pittsburgh 13, Pennsylvania (USA)

National Representatives

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Kyoto (Japan)

STRADINŠ, J., Dr.
Institute of Organic Chemistry, Academy of Science
Riga, Latvijas SSR (USSR)

Remark

HAMER, W.J., Dr., National Bureau of Standards
Washington, D.C. 20234 (USA)
is the liaison officer from the Electrochemistry Commission of the Physical Chemistry Division (I.3)

V.6 Commission: Equilibrium Data
Commission: Données d'Equilibre

Titular Members

Chairman

1963–1965 MARTELL, A.E., Prof., Department of Chemistry
Illinois Institute of Technology
Chicago 16, Ill. (USA)

Secretary

1963–1967 Bjerrum, J., Prof.
Chemistry Department I. Inorganic Chemistry,
The H.C. Ørsted Institute, University of Copenhagen
Universitetsparken 5, Copenhagen Ø (Denmark)

Members

1961–1965 Dyrssen, D., Dr., Department of Inorganic Chemistry
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1961–1965 Freiser, H., Prof.
Department of Chemistry, University of Arizona
Tucson, Ariz. (USA)

1963–1967 Marcus, Y., Dr., Ministry of Defence,
Atomic Energy Commission, Soreq Research Establishment
Yavne (Israel)

1963–1967 Schwarzenbach, G., Prof.
Chemisches Institut der Eidg. Techn. Hochschule
Zürich (Switzerland)

1961–1965 Sillén, L.G., Prof., Department of Inorganic Chemistry
Royal Institute of Technology (KTH)
Stockholm 70 (Sweden)

1961–1965 Yatzimirskii, K.B., Prof., Institute of General and
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Section: Bromatologie

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Commission: Oligo-éléments

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Commission: Additifs alimentaires

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VI.2 Section: Fermentation Industries
Section: Fermentation

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Section: Matières grasses

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VI.4 Section: Water, Sewage and Industrial Wastes
Section: Eaux, Égouts et Eaux industrielles résiduaires

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Section: Toxicologie et Hygiène industrielle

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VI.6 Section: Pesticides

Section: Pesticides

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Section: Plastiques et Produits de haute Polymérisation

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Section: Revêtements de Surface

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Commission: Analyse de la Cellulose

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VI.9.2 Commission: Chemical Analysis of Paper
Commission: Analyse chimique des Papiers

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PRESIDENTS REPORT 1961–1962

THE STATE OF THE UNION

The International Union of Pure and Applied Chemistry was first organized in 1919 under the aegis of the International Research Council which in turn was sponsored by the Committee on Intellectual Co-operation of the League of Nations. It is true that international chemical congresses had occurred periodically before World War I but the need of closer and continuing co-operation on many matters concerned with the universality of the language of science had become apparent. Hence this and several sister international scientific unions came into existence during that period of idealism which follows every great war.

The original structure of the union was relatively simple. There were the customary officers, commissions which dealt with business matters, and other commissions which supposedly dealt with the specific problems of the various branches of chemistry. The distinction between a Conference or business meeting and a Congress or scientific program was not always very definite. The first Conference was held in Rome in 1920 and for ten years one was held every year.

There was a Council which made the important decisions and which was generally composed of elder statesmen who could afford the necessary travel money to attend meetings regularly. Thus the representatives from the various countries were not always truly representative and interest in the Union was not widespread. There was in addition a General Assembly which met once during each Conference to which national representatives could be appointed almost at will. This Assembly did little else than listen more or less respectfully to the speech on the State of the Union such as I am still required by the Statutes to present.

Nevertheless many eminent chemists took a sincere interest in this Union during the twenty years between the two great world wars. The list of presidents during that period is a truly distinguished one. If the officers, Commission members, and Council members came mostly from Western Europe with a very few from North America, this was merely a reflection of the geographical locations where chemical research and chemical industry were relatively strong.

But the great depression of the 1930's and followed by the second great war produced profound changes not only in the geographical location of research and industry but in the attitude of the population of the world toward science. There may be those who would return to the good old prewar times when the Union appeared to consist mainly of old friends who gathered periodically for a round of social events, but the Union today will either accept the facts of life in the mid-twentieth century or cease to be an important influence in chemistry.

The fundamentally important work of the Union is performed by the Commissions. Many Commission members have given devoted service at great personal sacrifice, including often financial sacrifice. Only recently has it been possible adequately to meet costs of travel and subsistence for attending commission meetings. Often Commission members feel that they know little about union policies or what the objectives of the Union really are.

For these reasons the Executive Committee at its meeting in Tokyo in September 1962 voted to resuscitate a modified form of the General Assembly. This would be a meeting not only of the members of the Executive Committee and of the Bureau and of all national delegates to the Council, but also of all Commission members. Should all eligible persons attend there would be over 780 present.

It is not our intention at this meeting to take any binding decisions for this is not a legislative body duly constituted according to the Statutes of the Union. We hope rather to indicate what the Union has been doing and to give some personal opinions as to what the Union should do in the future.

As a background for this discussion we must give some history of the Union since the war.

Professor MARSTON T. BOGERT of Columbia University was elected President of the Union at the last prewar conference held in Rome in May 1939. The work of the Union almost completely ceased in September 1939 when the war started in Europe. At that time there were 20 adhering bodies: 16 from Western Europe, 1 from North America, 2 from Latin America, and only 1 from the rest of the world. The then existing Bureau consisted of 12 members, 10 from Western Europe and Professors M. T. BOGERT and R. E. SWAIN of Stanford University from the United States. There were also some peculiar memberships on Commissions with persons serving in areas in which their competence might be questioned.

The headquarters of the Union has always been officially in Paris, for many years at the Maison de la Chimie, with JEAN GERARD as Secretary General. Many of the men who had helped to found the Union in 1919 were still active at the beginning of the war but the younger generation of chemists was little concerned with the Union.

Thus the Union survived the war with the officers elected at Rome in 1938 but with one notable exception. For reasons which need not concern us here the Secretary General resigned in 1946 and the late Professor RAYMOND DELABY of the Faculty of Pharmacy of the University of Paris was chosen to serve on an interim basis. To the devotion of Professors DELABY and BOGERT the Union owes its vigorous revival after the war. They both gave unhesitatingly of their time and their energy.

A Reprise de Contact in London in 1946 laid the plans for the first Conference and Congress to be held postwar in London in 1947 at which time the Chemical Society of London would stage a deferred celebration of its 100th anniversary. To the then President of that Society, Sir CYRIL HINSHELWOOD, also belongs much of the credit for putting the Union back on its feet.

The officers elected in 1947 were Professor H. R. KRUYT of the Netherlands President, Professor RAYMOND DELABY of France Secretary General and Dr. LESLIE LAMPITT of the United Kingdom Treasurer. The latter post was a new one since prior to that time nearly all of the work of the Union had been conducted by the Secretary General. These officers really laid the plans for the future. Professor DELABY resigned for reasons of health in 1955 and Dr. LAMPITT continued until his death in 1957.

There had been a Bureau consisting of the officers and some elected members including three Vice-Presidents, but this Bureau met only briefly for a half hour to an hour every two years at the time of a Conference. Those of us who served on it did not feel that participated actively in the affairs of the Union. During the period 1947 to 1951 an Executive Committee began to function. This consisted of five persons: H. R. KRUYT (Netherlands) President, Sir IAN HEILBRONN (GB) Vice-President, E. BERNER (Norway) Vice-President, R. DELABY (France) Secretary General, LESLIE LAMPITT (GB) Treasurer. It was expanded to seven persons in 1957. This

is what it is today although if the new Statutes are adopted it will be expanded to eight by the addition of the immediate past president.

Thus the structure of the Union was still quite simple at the time of the Conference in Amsterdam in 1949.

The annual contributions to the Union fixed at the close of the war were $375 for countries in Category C with two votes in the Council, $525 for countries in Category B with four votes in the Council, and $675 for countries in Category A with six votes in the Council. The category to which a country was assigned was determined in theory by the Council but in practice a country itself asked to be assigned to a given category. The importance of a country in chemistry was the supposed basis for choice of category and not either its geographic size or the size of its population.

With these modest annual contributions the income was small, about $15,000 per year. But expenses were also small. None of the officers was paid, travel and subsistence were not paid before the war except for the Secretary General, office expenses were small because the help was mostly voluntary. Thus income always exceeded expenses and the Union accumulated substantial reserves. It even possessed a gold brick as a hedge against inflation!

At the close of World War II laboratories had been destroyed, chemists in many countries were dead or missing, foreign exchange was in short supply. Money to pay for travel to meetings was not available. Also it was felt that the Unions should be strengthened. In May 1946 Dr. Joseph Needham, the head of the Natural Sciences Section of the Preparatory Commission of Unesco, and Professor H.R. Kruyt of the Netherlands who had carried through the war as President of the International Council of Scientific Unions, agreed that a contract between Unesco and ICSU should be prepared whereby ICSU would receive an annual grant-in-aid from Unesco and in effect perform many of the international scientific functions which Unesco might otherwise have to assume. It was an attempt, therefore, to utilize effectively an existing international scientific organization.

This contract was prepared and duly signed and the Secretariat of the Preparatory Commission of Unesco inserted an item of $275,000 in the first annual budget of Unesco as a grant-in-aid for ICSU. This was passed by the First Conference of Unesco in November 1946.

Aside from a modest amount to operate the secretariat of ICSU, virtually all of this grant-in-aid was distributed by ICSU to the then existing *eleven* international scientific unions. The International Union of Pure and Applied Chemistry received about $25,000 for the year 1947 and this contributed in no small measure to the resounding success of the meetings in London in July 1947.

It would not be useful to give in detail the history for sixteen years of the Unesco grant-in-aid to ICSU. It would not make pleasant reading. Nevertheless some of our present day problems can only be understood if the implications of this history are understood.

It is quite certain that Dr. Needham and Professor Kruyt (who was elected president of IUPAC in 1947) visualized a continuing substantial support of ICSU by Unesco. It is equally certain that there was strong opposition to this grant-in-aid particularly on the part of several strong nations in Unesco. While it was admitted that ICSU and its Unions needed money in order to get going after the war, there were powerful interests which felt that ICSU should obtain as soon as possible independent financing.

The grant-in-aid to ICSU was reduced in the second budget and reduced again until it reached a level of $175,000 and there it remained for many

years. It is true that by giving certain service functions separate Unesco support the grant has been effectively increased. It is also true that ICSU increased its own income in 1956 sufficiently to cover its own administrative expense, thus freeing additional funds for allocation to the Unions. But the number of unions has increased to fourteen and some unions are more favored than others. IUPAC now receives usually about $12,000 per year with somewhat larger amounts for the years during which conferences are held.

Since IUPAC is a member of the ICSU family it is necessary both to state what the functions of ICSU have been and what we believe they should be. For several years following World War II and even continuing to the present time there was waged a great battle about the strength of ICSU. This battle was at times very bitter. The same battle is waged in learned societies, in universities, and in governments. There are many people, including scientists, who are opposed to change. At times this is mere fear of the unknown. Others are honestly opposed to any increase in bureaucracy and believe that strong secretariats increase unduly the costs of performing simple functions.

Certainly one must guard against unnecessary expense and unnecessary complications. Scientists are all too often occupied with committees and extraneous activities which do not advance science. On the other hand science plays a different role in human affairs from what it did even twenty years ago and unless decisions about science are to be made by non-scientists who do not receive proper advice, organizations of scientists must be prepared to consider problems of national and international import.

Between the two world wars there was no real need for a strong ICSU. ICSU served mainly as a forum for discussions of interdisciplinary problems. Its budget was modest. Its continued existence is a monument to the Secretary General, the late Professor Stratton of the University of Cambridge, who wrote his own letters, kept the accounts, and literally made ICSU his life's work. If the attitude of ICSU was inward toward the unions rather than outward toward the expanding horizons of modern science, no one should be blamed. Scientists themselves had not become accustomed to thinking in cosmic terms.

The second great war fundamentally changed the part played by science and by scientists in all countries. Whereas meteorology, oceanography, a few parts of geophysics, and some problems in epidemeology necessarily demanded international co-operation at the research level, the expensive new devices of modern physics, rockets which culminated by the placing in orbit of the Sputniks by the Soviet Union, as well as modern transportation which affects public health, all demand international scientific contacts of a new and expanding type.

It is now impossible to divorce many scientific programs from political implications. Satellites pass over many countries. Ocean currents wash the shores of many continents. Wind borne insects and bacteria traverse national frontiers. Statesmen are called upon to pass laws, to make treaties, and to discuss scientific questions which their trainings do not permit them fully to understand.

On the national level governments may call on scientists for advice. The main problem is one of educating governments about the necessity of seeking advice on scientific problems and of educating scientists sufficiently well to determine how scientific advice can be helpful.

The need for a strong ICSU which would act as a voice for «pure» science needs further amplification. While the chemist today uses expensive instruments such as spectrographs, nuclear magnetic resonance, electron spin resonance, mass spectrographs and the devices necessary for the

employment of radioactive isotopes, his needs are still modest compared to those of the nuclear physicist and infinitesimal compared to those of the geophysicist who tries to explore outer space.

International co-operation for chemists is required on the one hand because some countries are unable to provide experimental facilities for all types of chemical research and on the other because it is essential to have agreements so that the chemists of one country may understand the symbols and names used by chemists of another. The basic problems of chemistry and the problems of chemical industry generally can be carried out within the confines of one country. Only when questions of air or water pollution, international trade, or service to cosmic science arise does the chemist begin to worry about international boundaries.

The meteorologist, the geophysicist, and the epidemeologist must worry about large scale phenomena which are not confined to one country or even to this planet. They use techniques developed in the laboratory scale by mathematicians, physicists, chemists, and biologists but modern research in these fields requires literally milliards of dollars per year.

In ICSU there have been two kinds of conflict. The first arises because the unions have been loathe to see the limited funds from the Unesco grant-in-aid more widely distributed by the addition of new unions. The other arises between those disciplines such as mathematics, physics, chemistry, parts of biology which carry out research in the laboratory and those other disciplines which must of necessity be international such as geophysics, astronomy, radio science, astrophysics. One group sees the need for a strong interdisciplinary body, the other does not.

The long discussion and the bitter arguments about the structure and future of ICSU do little credit to the statesmanship of scientists. Should the control of ICSU lie in a General Assembly in which the countries have a majority vote or should it reside in the Unions and hence be a voice more nearly of the scientific community ? To the scientific community the answer should be an obvious one: ICSU should provide a voice for science and hence be as non-political as possible. Any representation of nations or adhering bodies on the central legislative body of ICSU will tend to increase the danger of political manoeuvers. On the other hand the present Executive Board of ICSU is composed solely of representatives of unions and it is this Board which has shown the least ability to understand the broad problems affecting science and to adopt a program of large scope. The majority of the national adhering bodies do not send any representatives at all to the General Assembly and several Unions show little real interest in ICSU.

Thus one must confess that ICSU is a weak organization largely because the majority of the scientific community sees no need for it to be strong. In our opinion this should be changed.

ICSU should serve three purposes: (1) It should act as a clearing house to provide scientific information upon request both to the United Nations and its specialized agencies and to nations; (2) It should provide a mechanism through the formation of special committees to co-ordinate international interdisciplinary programs; (3) It should be the body which distributes the Unesco grant-in-aid. Perhaps it will eventually be the central body for collecting and distributing the payments to all Unions from national adhering bodies. The present system of separate contributions is very complicated.

It may be objected that a strong ICSU means a strong bureaucracy. There is always this danger but on the other hand political bodies must have one point of contact with pure science and not fifteen or more. Thus

if one can make of ICSU a channel for obtaining information rather than an operating body it could serve a useful purpose.

The proposed new structure for ICSU retains a General Assembly which will meet every two years. An Executive Board is created with 14 union representatives and 10 national representatives. The officers would consist of a president, a secretary-general, a treasurer, 2 vice-presidents from unions and 2 from national adhering bodies. This structure is not ideal and represents a compromise between purely scientific and national representation. Rather than delay action or stand in the way of progress we believe that IUPAC should support this proposed structure.

Representatives of IUPAC will attend a General Assembly of ICSU during the next few months and in my personal opinion they should support moves to make ICSU into a strong international body truly representative of all of pure science. The proposed structure may be the best one can do. The proper financing of ICSU will be a very serious problem.

Now we may turn to the problems facing IUPAC. The present structure is on the whole adequate and flexible. The Statutes need revision because they are not always clear. Also the long term of office for the president creates for him a real burden both for time and for money. Thus the changes being proposed are neither very numerous nor in one sense very important. In another sense we believe they represent a significant improvement over the present statutes.

The main functions of IUPAC must be performed by Commissions working within the Divisions and these will be drawing rules for nomenclature, symbols, values of constants, etc. Other functions only performed on a modest scale must be expanded. These relate to agreements about purity, about health hazards, about standard methods of analysis, and many other problems of interest to the chemical industry. In the past IUPAC has done little for industry but as needs expand for trade agreements the Union should be in a position to give advice.

Many organizations both within the United Nations family and outside deal with problems related to chemistry. The Food and Agricultural Organization, the World Health Organization, the International Labor Organization, the International Standards Organization all are confronted with problems of chemical names, standards of purity, methods of analysis. Quite obviously IUPAC should not operate laboratories and it should not operate or co-ordinate research programs. It has neither the money nor the administrative staff to deal with such matters.

Moreover IUPAC cannot provide direct answers to all questions which might be referred to it. It may fulfill needs for advice and information in two ways: First by referring questions to Divisions, Sections, and Commissions of the IUPAC when such bodies are competent to deal with them; second, to refer questions and questioners to competent individuals, laboratories, or technical societies.

Thus one must distinguish clearly between furnishing advice and recommendations on those matters in which IUPAC is a recognized authority and furnishing advice on how information can be obtained. The former would include symbols, nomenclature, values of constants. In the latter IUPAC would merely perform a service to the best of its ability but should not assume responsibility for the quality of the advice.

These proposed functions demand a secretariat of technical competence. At present the staff is inadequate in size to perform the functions which eventually might be expected of it.

For four years IUPAC has been deeply indebted to four Basel companies for office space, secretarial help, office facilities, and for those perquisites available to industry but too costly for the Union to pay for

from its own income. The Union Bank of Switzerland also has assumed much of the burden of accounts, payments, and budgets, thus relieving the Honorary Treasurer and the Secretary General of many detailed and very heavy burdens. To these Basel companies and to the Union Bank we express our profound gratitude.

When one examines the budget one should in reality add an unknown amount, perhaps $50,000 to give an accurate idea of the cost of operating the Union. In spite of this generosity and in spite of the generosity of several adhering national bodies, we see further needs for funds. In particular we can have no positive assurance that the very great generosity of which we are the object will continue for many years. IUPAC should finance itself on an adequate and sound basis. Right as of this moment we believe that at least $50,000 should be added to the present cost of running the secretariat and that to permit meetings to be held in all parts of the world another $50,000 will be necessary. Thus we should visualize in the not too distant future an annual budget for IUPAC of $200,000 to $250,000. Only then should the Union really seek to play the role which it must play.

It is now necessary to review some of the events since the Conference at Montreal in August 1961. Since most of the important detailed work of the unions is performed by Commissions and Divisions which are part of the Sections, it is quite proper for these matters to be included in the reports of the section presidents.

The Executive Committee has felt the need of maintaining contact with all parts of the world. The meeting in November 1961 was held in Rome, the meeting of June 1962 at Brussels, the meeting of September 1962 in Tokyo, and the meeting of December 1962 in Cairo. At Brussels the entire Bureau met also. To our colleagues in Italy, in Belgium, in Japan, and in the United Arab Republic we extend our most sincere thanks for their warm hospitality. For the first time and indeed now for two times the Executive Committee has met outside of Europe and North America. The entire Bureau and possibly also the entire Conference must in the future meet in other parts of the world.

At the Montreal meeting the Council approved a new atomic weight scale based on the assumption that the atomic weight of carbon-12 is exactly 12.0000. . . . The practical change in the atomic weights for most chemical purposes was negligible but since the International Union of Pure and Applied Physics has seen fit to adopt also the scale based on carbon-12, the frustrations of dealing with two scales have now been eliminated. It would be unwise to single out the names of the key individuals who showed the necessary statesmanship to achieve this notable result but the entire scientific fraternity owes to them a real debt of gratitude. We mention only the name of Dr. E. WICHERS without whose tact and perseverance the outcome would have been in doubt.

One other vote at Montreal concerned the symbols for the Gibbs function H–TS and the Helmholtz function E–TS. The history of this matter will not be reviewed but G was adopted for the former and A for the latter. Thus the symbol F which was sometimes used for one and sometimes for the other is now outlawed. This result was achieved only after much bitter debate and some scientists are still unhappy. We do not know the ultimate outcome in other unions. We have decided firmly not to reopen this question here in London. Perhaps ultimately after tempers have cooled an objective discussion of the matter can be held.

The Commissions on Nomenclature have as usual been active. The Union owes much to the long service of men such as Professor VERKADE who have seen clearly that chemistry could not exist as a truly international

science without agreements on nomenclature. The research chemist must, of course, be an individualist but as LAVOISIER pointed out many years ago problems of nomenclature in science may not be treated on an individual basis.

The problems of organic nomenclature will never end but there will appear shortly a comprehensive report on the rules on which agreement has been reached. The rules of nomenclature of inorganic chemistry are also progressing and some have been published in final form.

It should be stated in passing that the language of commission reports always poses vexing questions. The Statutes and the By-Laws make no attempt to specify a language for such reports. We believe firmly, however, that each Commission for each report must stipulate the version which it considers to be authoritative. Translations must, of course, be made but a translation even when performed by an expert will not have the same authority as the original version to which the Commission agreed.

The problem of IUPAC publications has been a difficult one. In some instances in the past the name of the Union has appeared without official permission on books and reports. Many formats, many prices and varying degrees of excellence have all contributed to a complex and confusing situation.

The establishment of a new journal Pure and Applied Chemistry now gives a publication outlet for symposia, conferences and congresses as well as for certain commission reports. The Committee on Publications can decide on the papers to be published and whether or not the name of the Union can be used.

Any change in policy arouses criticism but for the vast improvement in the publication program, wo owe much to Dr. H.W. THOMPSON and to the Editor of Pure and Applied Chemistry, Prof. B.C.L. WEEDON.

Concluding remarks

Thus IUPAC is an active expanding organization. As I come to the close of my four years as President I must express my appreciation to the officers, the committee members, the commission members and the numerous persons in the national adhering bodies who have helped to make IUPAC what it is. There have been disagreements but usually they have been friendly ones. It has been a pleasure to work with all of these people.

I would, however, be ungrateful if I did not single out a few individuals for special mention.

Sir CHARLES DODDS has been Honorary Treasurer since 1957. He is a man of sound judgement, of charming personality, and of great stature. He has assumed new duties which make it impossible for him to continue. He will be sorely missed.

Dr. RUDOLF MORF has given of his time and energy unselfishly to the Union. Every person with energy who prosecutes a definite and vigorous program will arouse both admiration and antagonisms, but without such persons the world would not only be poorer but less interesting. The Union as it is today is an active viable organization and as such it owes much to Dr. MORF. It has been a pleasure to work with him.

Finally one of the greatest privileges in work with associations and societies is in the friendships one makes and cements. Without making any statements about his greatness as a chemist, for that is too well known to need mention, I may merely say that to learn to know Lord TODD better has made my hours with IUPAC well spent.

March 1st 1963 W. A. NOYES, Jr., President

BIENNIAL REPORT OF THE HONORARY TREASURER 1961–1962

1. INTRODUCTION

In 1961, just ten years after the Congress and Conference in New York and Washington to mark the occasion of the diamond jubilee of the American Chemical Society, the XXIst Conference and the XVIIIth Congress of the Union were held, also on the Continent of North America, in Montreal, Canada.

When preparing the Budget for 1961, two years before the actual expenditure, we had to take proper safeguards in order to provide sufficient finances to enable us, together with our hosts, to ensure a successful Conference and Congress. It was necessary to provide means of travel for the titular members to Canada, and it was also necessary to provide subsistence allowances to meet the living costs in Montreal. The Bureau decided, therefore, to run a deficit of some $100 000 in 1961, a deficit which should be covered mainly by our reserves and by a loan charged against the financial year of 1962.

In former years our experience was that only some sixty per cent of the titular members attended the Conferences, but this experience was not applicable to the Conference in Montreal because 1961 was the first time that IUPAC tried to pay full travel costs to the titular members attending the meeting.

1962, a non-Conference year, gave the opportunity to recover from the financial stress of 1961, but we tried for the first time to stimulate scientific activity by organizing and granting subvention to five Symposia, which were held in various parts of the world. It seemed necessary not only to support these Symposia morally, but to grant some token amount of a few thousand dollars to each Symposium. In this way, some influence could also be exercised thus ensuring to some degree the success of the Symposia.

2. INCOME

Indirect Income

Income, which was in former years actually the so-called indirect income from UNESCO through the channels of ICSU, remained at the very low figure as experienced in the past years, as follows—

$14 000.— in 1961
$14 000.— in 1962

Direct Income

1961 was the first year in which the increased dues were in force. Credit for this improvement has to be given to the Finance Committees, the first ad hoc Committee in 1959 presided over by Professor A. Tiselius of Sweden and a similar Committee established in 1961 chaired by Professor John C. Bailar, from the United States. The recommendations made by these two bodies were carried out firstly by Germany who voluntarily increased her annual contribution to $5 000, retroactive to 1960. This catalysing action was immediately followed by the generous British National Body (the Royal Society) and the British Chemical Industry. Also, the extraordinary contribution from the National Science Foundation, Washington, is responsible for the very substantial increase of IUPAC's income. As

a consequence, regular income in 1961 was increased to $62000 of which $45850 has been paid to the 31 December 1961. This compares very favourably with the regular income in 1960 which was only $33638. Voluntary contributions amounted to $28437 as detailed under the Realistic Budget.

In 1962, the Income out of the regular annual subscriptions paid by the Adhering Organizations was a little higher than in 1961, amounting to $64877.46 (+$16047.— from the previous years) owing to some increases in categories of some of the members, namely Australia, Belgium and India. The donations, however, did not reach the same amount as in 1961, but totalled $18398.84.

Extraordinary Donation

The Bureau in Brussels decided that the *pro diem* reimbursement promised by our Japanese hosts and any facilities, for those persons giving the main lectures, extended by the Japanese organizers, be listed as income. This voluntary contribution amounted to Y2694600 which was given by the organizers in Tokyo to the Session Chairmen, the invited Speakers, the members of the IUPAC Executive Committee, the members of the Commission on Molecular Structure and Spectroscopy and the Triple Commission on Spectroscopy. This figure must, of course, be listed also under the Expenditure Account.

At this stage, it may be of interest to see the development of the various sources of revenue since 1957. This can be divided roughly into the following headings:

	1957 $	1958 $	1959 $	1960 $	1961 $	1962 $
Indirect Income from ICSU	15040.18	15500.—	16522.47	11344.20	14000.—	14000.—
Annual Subscriptions from adhering organizations	22510.14	25766.37	26358.75	33638.98	74382.14	83276.30
Previous years	802.14	2151.83	897.40	550.—	1249.32	16047.—
	23312.28	27918.20	27256.15	34188.98	75631.46	99323.30
Donations included in total of Annual Subscriptions	—	—	—	7400.—	28437.—	18398.—
Dividends and Interest**	** 4119.80	5314.87	4921.33	6528.46	5096.26	5213.46
and small items as from publications***, etc.	***1283.53	1044.71	167.50	471.43	312.43	657.52
Royalties	–	–	–	–	–	4634.41

The grand total Income for the two years was $218868.84 compared with $ 101694.97 for 1959/60.

3. EXPENDITURE

In 1961 the total expenditure amounted to $95042.69 which compares very favourably with the Budget figures of $140039.—, $131839.— and $123739.— which were calculated on the assumption that more or less living costs be paid for the titular members in Montreal. This also shows how difficult it always is to make a realistic Budget two years in advance. It is very instructive to find out how and why such a favourable situation has been achieved. Our Canadian friends invited many titular members to give lectures at the XVIIIth Congress held in Montreal, and paid all their travel and subsistence expenses. The French National Body paid a substantial amount towards the travel costs of their titular members, as did also the USSR, and finally there was the first experiment with a charter flight which was a financial success.

The reduction in expenditure can be calculated as follows:

(a) Bureau and titular members who did not come to Montreal would have cost	$26516.—
(b) Bureau and titular members invited to lectures would have cost	$ 1066.—
(c) British titular members paid by the Royal Society	$ 2273.—
(d) French titular members paid for by their adhering organization	$ 4610.—
(e) German titular members paid for by their adhering organization	$ 1001.—
(f) USSR titular members paid for by their adhering organization	$ 6615.—
(g) Expenses for the Nomenclature Commission Meeting in Columbus, Ohio, and paid for by the US Government Office, amounted to	$ 4974.—
The total figure of unexpected saving is	$47055.—

To this sum, we must add the intended saving in respect of all those Divisions and Commissions which did not meet in Montreal in 1961, because of financial consideration. This amounted to $30299.—.

In 1962, the total expenditure amounts to USA Dollars 102096.49. This is the highest expenditure ever made in a non-Conference year, and as Treasurer I must draw attention to the financial consequences. Token amounts of between $2000 and $4000 were granted to the Symposia held in Brussels, Florence, Prague, Stockholm and Tokyo. This action, of course, completely absorbed the subvention received from ICSU. Also, there was the first move by IUPAC in fulfilling its task of being truly international in delegating a few scientists to attend the Symposium on Molecular Spectroscopy held in Tokyo, which caused the expenditure of some $25000.—. It is not my business as Treasurer to question these necessities, but simply to draw attention to these actions, which modest as they appear, involve the Union in financial burdens.

At this moment, it might be permitted to point out that there is a great difference between a truly international organization, whose first duty is to stimulate international co-operation and co-ordination, and say a government agency, with regard to travel expenditure.

It might be of general interest to see how expenditure was allocated to the six Sections over the past five years:

	1958 $	1959 $	1960 $	1961 $
Physical Chemistry Section	3111.17	9262.25	400.69	13252.86
Organic Chemistry Section	5267.30	3694.33	3969.89	1300.92
Inorganic Chemistry Section	2804.28	5519.66	2732.49	4157.23
Biological Chemistry Section	2821.50	3592.52	2678.21	975.09
Analytical Chemistry Section	1303.98	5494.24	356.10	14568.73
Applied Chemistry Section	3039.90	8316.54	2575.48	11822.80

Costs for printing and mailing the "Information Bulletin"

The figures for printing and mailing the "Information Bulletin" were $3143.— in 1959, $2679.— in 1960 and $3400.— in 1961 and $3000.— in 1962. Council must decide whether such expenditure is justified.

4. INVESTMENTS AND TAXATION

Most of the investments held by IUPAC are British stocks. Repeated reminders were sent from the tax office. In 1959 $942.31 was paid to the United Kingdom and in 1960 $641.78, in 1961 $2032.91 and in 1962 $2676.66 was paid. A decision must be taken by the Bureau and Council as to whether increased taxation by the United Kingdom will be accepted or whether investments be transferred to another country, more convenient to IUPAC at least as regards taxation. Advice has been taken, however, from Bankers and Solicitors who say that there would be no particular advantage in changing our investments or our domicile.

5. INVESTMENTS

The Treasurer and the Secretary General decided to buy a gold bar when gold was cheap and this action was endorsed by the Executive Committee. Council is now asked to give final approval of the investment policy as mentioned above and detailed in the list of securities.

The Income and Expenditure Account has been audited by a company of Chartered Auditors. ICSU auditors have also annually handled our accounts so that our book-keeping is double-checked.

6. BUDGET

"Realistic Budget"

A "realistic budget" was requested taking into account, and indicating under Income and Expenditure, all voluntary contributions such as those made by the President of IUPAC, by various organizations such as the Royal Society and travel support provided by countries that may do so in their own currencies, the Union Bank of Switzerland, and also the support given by the Swiss chemical companies for the office of the Secretary General. All these contributions and grants should be posted as income to IUPAC with an appropriate offsetting charge in the expense column.

These figures amount to the substantial sum of around $50000.— which should be added to the Budget.

The Budget proposed for the Conference year 1963 was printed in detail in the "Information Bulletin" No. 17, reprint is appended to this report.

The Budget for 1964 is based, on the income side on the assumption that no change in the annual subscriptions is made, namely—

Category A1	$ 2600
Category A2	$ 5000
Category A3	$10000
Category B1	$ 800
Category B2	$ 1600
Category C	$ 450

It is very doubtful that the small ICSU subvention will remain, but it is hoped that the voluntary contributions by the United Kingdom, USA and others will continue. Also, it is understood that the indirect contribution made by the Chemical Companies in Basle can be maintained.

On the expenditure side, we have foreseen that in the non-Conference year of 1964 a few Symposia will be organized and that some small activity be sponsored in Australia, the Middle East and South Africa as a second step towards truly international activity.

We must, of course, in 1964 achieve a positive financial result as a provision for 1965—a Conference Year.

IUPAC is indebted to the member countries who have followed the advice of the two Finance Committees in a very generous way. Special thanks must also be extended to Mr. G. HANSELMANN and Mr. H. BAUMANN of the Union Bank of Switzerland, whose services have been invaluable. We must also express our gratitude to Mrs. E. BARRON and Mrs. T. BRABAZON and to Dr. D. C. MARTIN of the Royal Society for their assistance.

E. CHARLES DODDS
Treasurer

London, February, 1963

BUDGET 1963

I. INCOME *(based on figures for 1961)*

The regular income is given on the assumption that the Adhering Organizations will contribute the same annual dues in 1963 as they did in 1961 (final figures are not yet available for 1962). Note has been taken of the increased annual dues emanating from change of category—Belgium to Category A1, Australia to Category A1, India to Category B2 and additional members Korea and Viet-Nam to Category C.

Dividends and interest are estimated as $6 000 and the annual subvention from ICSU is already known.

Voluntary contributions have not been taken into account.

	$
Argentina	450
Australia	2600
Austria	450
Belgium	2600
Brazil	800
Bulgaria	450

Canada	2600	Luxembourg	100
China (Taiwan)	800	Holland	2600
Colombia	450	Norway	800
Czechoslovakia	800	Poland	800
Denmark	1600	Portugal	450
Finland	450	Rumania	450
France	2600	Spain	800
Germany	5000	Sweden	2600
Great Britain	10000	Switzerland	2600
Hungary	450	South Africa	800
India	1600	Turkey	450
Ireland	100	United Arab Republic	450
Israel	800	USA	10000
Italy	2600	USSR	2600
Japan	2600	Viet-Nam (South)	450
Korea (South)	450	Yugoslavia	450
			66650
Interest and Dividends			6000
ICSU			14500
			87150

II. EXPENDITURE calculated to the nearest dollar

The composition of the Bureau, Divisions*, Commissions, etc., given in the Comptes Rendus XXI, serves as a basis for the calculation of the expenses to be reimbursed to the Titular Members.

(a) Rail, sea and air fares have been assessed according to the tariff for 1961, based on information from Thomas Cook & Sons. The amounts for 1st class return rail and sea, economy class return by air (with jet service) are given. Fares of less than $20 have not been included.

(b) With regard to subsistence allowances, a fair estimate has been made.

(c) When looking at the figures allocated for the various Divisions* and Commissions, it must be borne in mind that those members who have more than one function e.g. as members of the Bureau, are listed for travel and subsistence allowances under the heading of Bureau Member and the total figure assessed for the Division or Commission is decreased automatically.

(d) In principle, no subvention shall be given to meet costs of meetings which will be held in places other than London, where the next Conference will be held. However, for the Nomenclature Commissions who need much more time for elaboration of their rules, special arrangements are provided.

		XXIInd Conference London 1963		*Administrative Expenses 1963*
		Travel to London	*Subsistence*	
I.	**Physical Chemistry Section**	$	$	$
	Section Committee	2 055	756	–
I.1	Commission on Physico-Chemical Symbols and Terminology	1 434	540	–
I.2	Commission on Thermodynamics and Thermochemistry	1 532	540	–

I.3	Commission on Electrochemistry	1 654	756	–
I.4	Commission on Macromolecules	2 215	540	–
I.5	Commission on Physico-Chemical Data and Standards	2 089	540	–
I.6	Commission on Molecular Structure and Spectroscopy	2 600	648	–
I.7	Commission on Colloid and Surface Chemistry	2 500	756	–
	Symposia			
	Administrative Expenses	–	–	100
	"Bulletin of Thermodynamics and Thermochemistry"	–	–	1 000
	Total	16 079	5 076	1 100

II. Section of Inorganic Chemistry

	Section Committee	1 625	756	–
II.1	Commission on Atomic Weights	1 097	648	–
II.2	Commission on the Nomenclature of Inorganic Chemistry	1 613	540	–
II.3	Commission on High Temperatures and Refractories	1 414	1 002	–
II.4	Commission on Geochemistry	4 054	756	–
	Proviso for additional meetings	1 500	–	–
	Symposia			
	Administrative Expenses	–	–	100
	Total	11 303	3 702	100

III. Section of Organic Chemistry

	Section Committee	2 090	540	–
III.1	Commission on the Nomenclature of Organic Chemistry	839	648*	
III.2	Commission on Codification, Ciphering and Punched Card Techniques	–	–	–
	Study Group for Information Retrieval	3 000	–	–
	Symposia			
	Administrative Expenses	–	–	100
	Total	5 929	1 188	100

IV. Section of Biological Chemistry

	Section Committee	1 188	540	–
IV.1	Commission on the Nomenclature of Biological Chemistry	1 260	1 440*	–
IV.2	Commission on Proteins	1 795	756	–
IV.3	Commission on Clinical Chemistry	2 209	1 002	–
	Meetings in Basel	3 300	–	–
	Symposia			
	Administrative Expenses	–	–	360
	Total	9 752	3 738	360

V. Section of Analytical Chemistry

	Section Committee	3 036	756	–
V.1	Commission on Analytical Reactions	2 610	648	–
V.2	Commission on Microchemical Techniques	1 697	864	–
V.3	Commission on the Nomenclature of Analytical Chemistry	1 234	432	–
V.4	Commission on Spectrochemical and other Optical Procedures	1 809	756	–
V.5	Commission on Electrochemical Data	1 051	648	–
V.6	Commission on Equilibrium Data	3 114	864	–
	Symposia			
	Administrative Expenses	–	–	1 200
	Total	14 551	4 968	1 200

VI. Applied Chemistry Section

	Section Committee	1 589	540	–
VI.1	Food Division	901	756	–
VI.2	Water, Sewage and Industrial Wastes Division	871	648	–
VI.3	Pulp, Paper and Board Division	1 241	756	–
VI.4	Plastics and High Polymers Division	1 619	756	–
VI.5	Pesticides Division	2 181	648	–
VI.6	Organic Coatings Division	1 283	864	–
VI.7	Toxicology and Industrial Hygiene Division	3 337	648	–
VI.8	Fermentation Division	1 837	864	–
VI.9	Oils and Fats Division	571	648	–
	Symposia			
	Administrative Expenses			
	Section	–	–	600
	Oils and Fats Division	–	–	600
	Survey	–	–	2 100
	Compilation of reports	–	–	300
	Total	15 430	7 128	3 600

Divers

Ad Hoc Committee on Chemical Technology	3 000	–	–
Travel and administrative expenses – President	2 000	–	–
Travel and administrative expenses – Treasurer	300	–	–
Travel and administrative expenses – General Secretariat	1 900	–	16 500
Bureau meeting	6 800	–	–
Executive Committee meetings	7 000	–	–
Editorial Board	2 500	–	–
Scientific Editor	2 500	–	–
Butterworths	–	–	–
"Comptes Rendus"	nil	–	–
Information Bulletin	4 000	–	–
Taxes GB	2 500	–	–
3% ICSU contribution	2 400	–	–
Full time Administrative Secretary (see Bureau Minutes, Brussels)	10 000	–	–
Section Presidents' meetings	600	–	–
Final drafting and printing of Statutes	1 500	–	–

Ad Hoc Finance Committee meetings	500	–	–
Ad Hoc Committee on Co-ordination on the teaching of chemistry	3 000	–	–
"Councillors-at-Large"	6 500	–	–
Sponsoring one symposium	1 000	–	–
* Subject to change			
Total	58 000	–	16 500

Recapitulation

		Travel to London	*Subsistence*	*Administration*	*Tota* $
I.	Physical Chemistry Section	16 079	5 076	1 100	22 2
II.	Section of Inorganic Chemistry	11 303	3 702	100	15 1
III.	Section of Organic Chemistry	5 929	1 188	100	7 2
IV.	Section of Biological Chemistry	9 752	3 738	360	13 8
V.	Section of Analytical Chemistry	14 551	4 968	1 200	20 7
VI.	Applied Chemistry Section	15 430	7 128	3 600	26 1
	Divers	58 000	–	16 500	74 5
	Grand Total	131 044	25 800	22 960	179 8

Contingency Fund for future activity, e. g. XXIInd Conference . . . . US $10 0

Zürich, 22 May, 1963
Löwenstrasse 56

To the Executive Committee
International Union of Pure and Applied Chemistry
Basle—Switzerland

AUDITORS' REPORT

We have examined the balance sheet of International Union of Pure and Applied Chemistry as at 31 December, 1962, and the related statements of profit and loss for the two years then ended. Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the enclosed balance sheet and the statements of profit and loss together with the return of supplementary information present fairly the financial position of the International Union of Pure and Applied Chemistry at 31 December, 1962, and the results of its operations for the two years then ended, in conformity with generally accepted accounting principles.

Neutra Treuhand A.G.
Accountants and Auditors
(Lauber) (ppa. *Krieg)*

BALANCE SHEET AS AT DECEMBER 31, 1962

(Expressed in US-Dollars)

Assets

Cash in Banks		20 0
Bankers Acceptances (Commercial Bills)		83 0
Bullion Account		14 1
Marketable Securities—at cost (Schedule A) (Market Value $85 294.76) . . .		50 6
Accounts Receivable		1
Other Assets		2 3
	US-$	170 4

Note: Subscriptions outstanding as at 31 December, 1962, aggregate . . . . US-$ 7 450.—

COMPARATIVE STATEMENT OF INCOME AND EXPENDI-TURES, YEARS ENDED DECEMBER 31, 1961 AND 1962

(Expressed in US-Dollars)

Income

		1961		*1962*
Subscriptions				
Current Year	74 382.14		64 877.46	
Previous Year	1 249.32		16 047.—	
Voluntary Contribution	—.—	75 631.46	18 398.84	99 3
Interest and Dividends earned		5 096.26		5 2
Sale of Publications	312.43		657.52	
Sale of Publications—Account Butterworth	—.—	312.43	167.71	8
Profit on Investments		2.54		
Royalties from Butterworth		—.—		4 6
		81 042.69		109 9
UNESCO GRANTS ACCOUNT				
Unexpended balance of grants from previous years	—.—		—.—	
Subventions collected during year .	14 000.—	14 000.—	14 006.90	14 0
		US-$ 95 042.69		US-$ 124 0

Exhibit I

lities and net worth

›ended Balance of UNESCO Grants		822.33
nts Payable		10.30
›d Liabilities		33 329.21
'orth:		
apital Account	102 139.36	
eserve	26 294.48	
	128 433.84	
ıs for the twelve months ended 31 December, 1962	7 899.91	136 333.75
	US-$	170 495.59

Exhibit II

nditure

	1961		1962	
Expenses				
alaries for clerical assistance (B) .	3 997.06		45.80	
rinting, Stationery and				
Miscellaneous (B)	15 757.44	19 754.50	20 333.20	20 379.—
l and Subsistence Allowances (B) .	60 873.74		49 546.14	
l and Subsistence Allowances—				
pecial Account	—.—		20 000.—	
bution to Symposiums	—.—		15 011.56	
ation	3 185.02		8 039.02	
	64 058.76		92 596.72	
ess: Subventions collected from UNESCO (Grants)	14 000.—	50 058.76	14 006.90	78 589.82
Expenses				
ank Charges	226.98		305.41	
ubscription to ICSU	1 118.—		—.—	
'axes	2 032.91		2 676.66	
udit and Accounts charges . . .	207.41		69.36	
osses on Investments	—.—	3 585.30	29.97	3 081.40
nge Differences (net)		368.04		46.27
		73 766.60		102 096.49
us for period		7 276.09		7 899.91
		81 042.69		109 996.40
SCO GRANTS ACCOUNT				
Expenditures out of grants during ear	30 532.—		24 871.75	
ess: IUPAC Funds, overdraft UNESCO a/c	16 532.—	14 000.—	10 864.85	14 006.90
		US-$ 95 042.69		US-$ 124 003.30

STATEMENT OF MARKETABLE SECURITIES OWNED AS
31 DECEMBER, 1962

Name of Investment	*Interest rate p.a.*	*No Un*
Held by Baring Brothers & Co. Ltd., London		
British Government Savings Bonds 1955/65	3 %	
British Government War Stock	3½%	
The English Electric Company Limited		
Debenture stock 1972/74	4½%	
Ordinary stock		8
Pearl Assurance Company Limited		
Ordinary stock		2
Royal Dutch Petroleum Company		
Ordinary stock		1
Ordinary stock—admin. certs.		
The Shell Transport and Trading Co. Ltd.		
Ordinary shares—registered		2 2
Unilever N.V.		
Ordinary sub shares—registered		5
Held by Morgan Guaranty Trust Company, New York		
American Electric Power Co.		
Common Stock Shares		1
E. I. Du Pont de Nemours & Co.		
Common Stock Shares		
Johns Manville Corporation		
Common Stock Shares		
General Motors Corporation		
Common Stock Shares		
Held by Union Bank of Switzerland, Zurich		
Royal Dutch Petroleum Company		
Società Edison S.p.A.		2
Compagnie de Saint-Gobain		
Rhône—Poulenc S.A.		
Pechiney S.A.		
Motor Columbus		
Elektro-Watt AG		
Units EURIT		1

...lue	per Unit	Market Value as at 31 December, 1962 Total		in US-$	Book Value (at original cost) in US-$
800.—.—	96½%	£	2 702.—.—	7 585.86	6 849.94
450.—.—	61 %	£	884.10.—	2 483.23	4 145.09
100.—.—	84¼%	£	84. 5.—	236.53	273.73
877.—.—	30.—	£	1 315.10.—	3 693.27	3 368.18
56.—.—	£ 11¾	£	2 632.—.—	7 389.34	3 481.72
20.—	£ 16⅜	£	3 193. 2.6	8 964.70	2 693.19
20.—	£ 16⅜	£	114.12.6	321.81	–
5.—	£ 41.—	£	4 592.—.—	12 892.04	3 424.58
12.—	£ 8½	£	4 641.—.—	13 029.61	2 048.05
6.50	$ 35⅝	£	2 186. 5.8	6 137.99	1 402.46
75.—	$ 239½	£	1 281.16.—	3 598.65	1 462.49
275.—	$ 43.—	£	543.16.7	2 369.05	1 642.75
13⅓	$ 58½	£	165.18.3	465.80	25.79
20.—	Fr.s. 188.—	Fr.s.	11 280.—	2 608.09	2 359.86
300	Lit. 4 425	Lit.	1 106 250	1 782.84	2 283.—
75.—	Fr.f 319.—	Fr.f.	6 380.—	1 302.04	1 768.92
50.—	Fr.f. 411.—	Fr.f.	6 165.—	1 258.16	1 592.03
50.—	Fr.f. 213.—	Fr.f.	5 325.—	1 086.73	1 387.01
500.—	Fr.s. 1 810.—	Fr.s.	9 050.—	2 092.49	2 927.85
500.—	Fr.s. 2 590.—	Fr.s.	7 770.—	1 796.53	2 525.95
–	Fr.s. 173.—	Fr.s.	18 165.—	4 200.—	4 965.45
				$ 85 294.76	$ 50 628.04

STATEMENT OF EXPENDITURE BY SECTIONS

Schedule B

	Salaries for clerical assistance		*Printing, stationery and General Office Expenses*		*Travel and subsistence allowances*		*Total*	
	$ *1961*	$ *1962*	$ *1961*	$ *1962*	$ *1961*	$ *1962*	$ *1961*	$ *1962*
Physical Chemistry Section	39.34	45.80	225.46	490.75	12 988.06	15 152.05	13 252.86	15 688.60
Inorganic Chemistry Section . . .	—.—	—.—	254.68	426.20	3 902.55	981.92	4 157.23	1 408.12
Organic Chemistry Section	—.—	—.—	—.—	1 141.98	1 300.92	4 169.67	1 300.92	5 311.65
Biological Chemistry Section . . .	—.—	—.—	170.82	116.51	804.27	754.44	975.09	870.95
Analytical Chemistry Section . . .	—.—	—.—	238.85	227.84	14 329.88	304.30	14 568.73	532.14
Applied Chemistry Section	—.—	—.—	963.27	2 895.05	10 859.53	3 195.11	11 822.80	6 090.16
Executive Committee and Bureau .	3 957.72	—.—	13 904.36	15 034.87	16.688.53	24 988.65	34 550.61	40 023.52
	$ 3 997.06	45.80	15 757.44	20 333.20	60 873.74	49 546.14	80 628.24	69 925.14

STATEMENT OF SEPARATE FUNDS AS AT 31 DECEMBER, 1962

Schedule C

It is hereby certified that besides of the assets shown in the balance sheet as at 31 December, 1962, the Union maintains the following separate funds:

(1) Fr.s. Current Account with Union Bank of Switzerland, Zurich	Fr.s. 3 610.—
(2) 3¼% Bonds Union Bank of Switzerland, maturing 14 March, 1966, nominal value	Fr.s. 25 000.—
Total	Fr.s. 28 610.—

The Current Account is made up as follows:

			DEBIT	*CREDIT*
1961	1 January	Balance brought forward	28 443.—	
		Interest credited for the year 1961 (net)	173.75	
1962	16 March	Purchase of Bonds as specified above		25 060.—
		Interest credited for the year 1962 (net)	53.25	
	31 December	Balance, as above		3 610.—
			Fr.s. 28 670.—	28 670.—

MEMORANDUM—IUPAC AD-HOC FINANCE COMMITTEE

After discussions with Mr. Hanselmann at the Union Bank of Switzerland in Zürich on 19 June, 1963, I concluded that the following points deserve consideration by the IUPAC Ad-hoc Finance Committee:

I. Restrictions on investments

I am informed that the Bureau of IUPAC adopted a policy many years ago that the funds of the Union should be invested only in securities of the chemical industry, or in government bonds and similar fixed-income securities. This was later amended to permit investment in securities of public utilities.

This policy probably has not yielded maximum income to the Union from its investments, and consideration should be given to allow more freedom in choice of investments.

II. Removal of investments from the United Kingdom

Investments now held in the United Kingdom are taxed by the government.

Many countries do not tax the income of organisations such as IUPAC, and serious consideration should be given to removing funds from the United Kingdom to a country, such as Switzerland, in which the income would be tax-free.

III. Increase dues in top categories

The present income from dues to the Union is not adequate to support the organisation and consideration should be given to increasing its income either by (a) adding another dues category at a higher annual rate than present $10000 maximum, or (b) increasing the dues in the top 2 or 3 existing categories, but not equally in all of them.

IV. Contributions from industry

Consideration should be given to means for obtaining more direct contributions to the Union from chemical corporations.

V. Contract with Butterworth

The income received by IUPAC from the contract under which Butterworth prints certain Union documents yields a very small return.

VI. Budget

The expenditures of the Union have now reached such a level that consideration should be given to operations under a budget. The rational planning of the Union's financial affairs is difficult without budgetary control of all operations.

VII. Contributed services and facilities

Services and facilities provided the Union through the good will of the Swiss pharmaceutical companies are not now included either as income or expense on the books of the Union. Also, certain expenses paid by other organisations are omitted.

Thus, the books do not realistically reflect the total cost of operating the Union.

VIII. Reserves

The reserves of the Union are sufficient to cover approximate one year's operating expenses.

This appears inadequate for an organisation like the Union, which does not receive its income on fixed dates. It would be better if a way could be found to increase the reserves to an amount equal to 2 years expenses.

IX. Permanent finance committee

Expenditures of the Union are now at such a level that it would seem appropriate to establish a permanent finance committee which could advise and consult with the treasurer about the handling of the Union's affairs.

Most organisations have a finance committee long before they reach the size that the Union now has.

On 2nd July, 1963, at Höchst, Germany, Professor Dr. Otto Horn and I have discussed the foregoing points. We are in agreement, I believe, that they are all matters deserving consideration by the Ad-hoc Finance Committee during its forthcoming meeting in London. Dr. Horn has written in memorandum covering his thoughts, and has included some additional points.

signed P. M. Arnold
President of the ad-hoc Finance Committee

On the occasion of a visit to Mr. HANSELMANN of the Union Bank of Switzerland, Zürich on June 18, 1963, I satisfied myself that the audit conducted by Neutra-Treuhand AG gives the impression that the IUPAC practises economy in its administrative costs which is only possible on account of the fact that the General Secretary is generously supported by his firm; other comparable associations often have far higher expenses.

Although the financial position can be described as tolerable it does appear to me to be worth aspiring after to at least build up reserves in the near future that cover all requirements for the next three years. A decision would have to be made as to whether this should be made possible by an increase in receipts or by temporarily reducing contributions to symposia.

It does not, however, appear to me to make sense that income tax should be paid on securities held by *Baring Brothers & Company Ltd.*, London; this amounted to $2676.66 in the past year. I should therefore ask you to consider whether these securities should not perhaps be transferred to Switzerland where the acknowledgement of the IUPAC as a non-profit making organization would certainly not pose any difficulties.

Everything should be done to ensure that the contributions of UNESCO which have amounted to $14000 per annum during recent years and which are now obviously in question should be granted in the future because without them the financial position would deteriorate considerably.

PROF. O. HORN

Lors d'une entrevue le 18 juin 1963 avec M. HANSELMANN, Union de Banques Suisses, à Zurich, j'ai pu me convaincre que l'étude menée par la Neutra-Treuhand AG a révélé que l'IUPAC est très économe en ce qui concerne ses dépenses administratives, ce qui n'est possible que parce que le secrétaire général jouit d'un grand appui de la part de sa maison. D'autres associations du même ordre ont des dépenses beaucoup plus élevées.

Bien que la situation financière puisse être considérée cette année comme passable, il me semble toutefois souhaitable de constituer dans le proche avenir une réserve couvrant les besoins d'au moins trois ans. Il est à décider de savoir si ceci peut être obtenu en augmentant les recettes ou en réduisant provisoirement l'aide apportée aux symposiums.

Cependant, il ne me semble pas utile que sur les valeurs déposées à la *Baring Brothers & Company Ltd.*, à Londres, un impôt sur le revenu ait dû être versé, soit 2676.66 $ l'an passé. Aussi voudrais-je vous prier d'examiner s'il ne serait pas préférable de transférer ces valeurs en Suisse, où il sera certainement possible de faire, sans difficulté, reconnaître l'IUPAC comme «non-profit organisation».

Il faut mettre tout en œuvre pour que les cotisations de l'UNESCO qui, dans les dernières années, se montaient annuellement à 14000 $ et dont le versement à venir semble douteux, continuent à être payées, car leur disparition compromettrait fortement la situation financière.

PROF. O. HORN

BUDGET 1964/1965

At the Council meeting in London, it was possible to throw some light on the 1965 Budget because the main expenditure for 1965—a conference year—is more or less known. It was not, however, possible to make positive indications on the Budget for 1964 because at the time of the Conference in London the activities, programmes and the composition of the various Divisions was not known in detail.

Income

With regard to the income, Council voted on the minimum annual dues as follows:

Category A1	$ 2 600	Category B1	$ 800
Category A2	$ 5 000	Category B2	$ 1 600
Category A3	$ 10 000	Category C	$ 450
Category A4	$ 25 000	Category D	$ 100

Expenditure

The Council resolution concerning expenditure had to be restricted to a decision in principle. The Budget for 1964 and the Budget estimate for 1965 as now compiled are based on the suggestions and proposals made by the Division Presidents with regard to their proposed activities and programmes for the next two years.

The calculation of travel and subsistence for 1964 and for 1965 is based on the Comptes Rendus XXI (Montreal 1961). Only one exception was made in that the composition of the new Bureau was considered since it is completely different from the old one. The figures are based on return economy class air fares as per information from Thos. Cook & Son. Amounts exceeding those stipulated will not be reimbursed. These figures would, however, change in case the airlines change their tariffs. The cheaper trans-Atlantic winter fares, wherever applicable, will reduce the actual expenditure.

Procedure for reimbursement

Only Titular Members listed in the current Comptes Rendus are entitled to travel and subsistence allowances. The only exception to this rule is the rare case of a Titular Member elected during the interval between two successive Conferences with the written approval of the Executive Committee.

Secretaries of Divisions, Sections and Commissions should send full details of proposed meetings to the Secretary General as early as possible in advance of the date, together with a request for claim forms. These forms should be completed by members and returned to the Secretary General who will forward them to the President of the Division or Chairman of the Commission for signature certifying attendance of the member concerned at the meeting and transmission to the Treasurer for approval and payment through the Union's Bankers.

Travel and subsistence allowances cannot be paid in advance of meeting. Members are entitled to economy class return air fares and any difference therefrom should be borne by the member himself.

It is hoped that Secretaries will adhere to the procedure set out above so as to ensure smooth working of our financial affairs.

Titular members who have more than one function in IUPAC have been listed only once in the budget.

Symposia

Subventions for Symposia which fall under the UNESCO-ICSU subvention have been allocated in the Budget according to the following rules which were adopted during the London Conference.

(1) Sponsorship should not be granted to any particular meeting unless an application is made through the Division Committee, at least two years before the meeting.

(2) In particular, we do not approve of sponsorship of any meeting which is organized by a body not incorporated in one way or another in the structure of IUPAC.

(3) Sponsorship involving financial support is given only to those Symposia and meetings organized by the Divisions themselves.

(4) The organizers must ask the advice of the Editorial Board and settle the question of publication before sponsorship can be given by the IUPAC Executive Committee.

Estimated Income for 1964 (*based on figures of 1963*)

	$		$
Argentina	450	Japan	2 600
Australia	2 600	Korea (South)	450
Austria	450	Luxembourg	100
Belgium	2 600	Holland	2 600
Brazil	800	Norway	800
Bulgaria	450	Poland	800
Canada	2 600	Portugal	450
China (Taiwan)	800	Rumania	450
Colombia	450	Spain	800
Czechoslovakia	800	Sweden	2 600
Denmark	1 600	Switzerland	2 600
Finland	800	South Africa	800
France	2 600	Turkey	100
Germany	5 000	United Arab Republic	450
Hungary	450	United Kingdom	10 000
India	1 600	USA	10 000
Ireland	100	USSR	2 600
Israel	800	Viet-Nam (South)	450
Italy	2 600	Yugoslavia	450
		Total	66 650

Income	$	Donations:	$
from adhering Bodies	66 650	UK	10 941
Interest and Dividends	6 000	USA	20 000
ICSU Contribution	14 500	UBS	5 000
UNESCO Contract	?	Chemical Companies	
Royalties	6 818	in Basle	50 000
			179 909

	Proposed Budget 1963			Proposed Budget 1964			Tentative Budget 1965*		
	Travel	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*
I. PHYSICAL CHEMISTRY	$	$	$	$	$	$	$	$	$
Division Committee	2 055	630	100	—	—	100	2 055	630	100
"Bulletin of Thermodynamics and Thermochemistry"	—	—	1 000	—	—	1 000	—	—	1 000
Block grants									
Symposium on Reactivity of Solids in Munich 1964	—	—	—	2 000	—	—	—	—	—
Symposium on Organic Photochemistry in Strasbourg 1964	—	—	—	1 000**	—	—	—	—	—
I.1 Symbols, Terminology, Units	1 434	450	—				1 434	450	—
Meeting in Copenhagen				2 100	400				
Meeting in ...	—	—	—	4 500??	—	—	—	—	—
I.2 Thermodynamics, Thermochemistry	1 532	450	—	—	—	—	1 532	450	—
Representation to IUPAP	—	—	—	300	—	—	—	—	—
I.3 Electrochemistry	1 654	630	—	—	—	—	1 654	630	—
I.4 Macromolecules	2 215	450	—	—	—	—	2 215	450	—
I.5 Data and Standards	2 089	450	—	—	—	—	2 089	450	—
Representation (Hamburg)	—	—	—	500	—	—	—	—	—
I.6 Molecular Structure and Spectroscopy	2 600	540	—	—	—	—	2 600	540	—
I.7 Colloid and Surface Chemistry	2 500	630	—	—	—	—	2 500	630	—
	16 079	4 230	1 100	10 400	400	1 100	16 079	4 230	1 100
		21 409			11 900			21 409	

* Note: As an approximate guide figures of 1963 have been stated
** Subject to approval by the Bureau

		Proposed Budget 1963			Proposed Budget 1964			Tentative Budget 1965*		
		Travel	Subsistence	Administration	Travel	Subsistence	Administration	Travel	Subsistence	Administration
II.	INORGANIC CHEMISTRY	$	$	$	$	$	$	$	$	$
	Division Committee	1 625	630	100	—	—	150	1 625	630	150
	Block grants									
	Symposium on Coordination Chemistry in Vienna 1964	—	—	—	2 000	—	—	—	—	—
	Symposium on Catalysis in Amsterdam 1964	—	—	—	2 000	—	—	—	—	—
II.1	Atomic Weights	1 097	540	—	—	—	—	1 097	540	—
II.2	Nomenclature	1 613	450	—	—	—	—	1 613	450	—
	Meeting in Basel	—	—	—	290	90	—	—	—	—
	Meeting in France	—	—	—	2 540	900	—	—	—	—
II.3	High Temperature and Refractories	1 414	810	—	—	—	—	1 414	810	—
II.4	Geochemistry*	4 054	630	—	—	—	—	4 054**	630**	—
		9 803	3 060	100	6 830	990	150	9 803	3 060	150
								—2 027	—315	
								7 776	2 745	
			12 963			7 970			10 671	

* Note: As an approximate guide figures of 1963 have been stated

** Reference is made to the London resolution which is not quite clear; our view is that a joint Commission be formed and that only 50% of the expenses be paid by IUPAC. This has been taken care of in the total.

		Proposed Budget 1963			Proposed Budget 1964			Tentative Budget 1965*		
		Travel	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*
III. ORGANIC CHEMISTRY		$	$	$	$	$	$	$	$	$
	Division Committee	2 090	450	250	—	—	—	2 090	450	—
III.1	Nomenclature	839	540	—	—	—	—	839	540	—
	Meeting in Basel 1964	—	—	—	2 425	300	—	—	—	—
	Meeting in Caen 1964	—	—	—	2 080	700				
	Block grants									
	Symposium on the Chemistry of Natural Products in Kyoto 1964	—	—	—	5 000	—	—	—	—	—
	10 members of the Division Committee and of the Executive Committee to Kyoto 1964 . . .	—	—	—	12 000	2 000	—	—	—	—
	Symposium on Organic Phosphorus Chemistry in Heidelberg 1964	—	—	—	1 000**	—	—	—	—	—
		2 929	990	250	21 505	3 000	—	2 929	990	—
			4 169			24 505			3 919	

* Note: As an approximate guide figures of 1963 have been stated

** Subject to approval by the Bureau

	Proposed Budget 1963			Proposed Budget 1964			Tentative Budget 1965*		
	Travel	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*
IV. BIOLOGICAL CHEMISTRY	$	$	$	$	$	$	$	$	$
Division Committee	1 188	450	360	—	—	460	1 188	450	460
IV.1 Nomenclature	1 260	1 440	—	—	—	—	1 260	1 440	—
Meeting in Basle	—	—	—	200	?	—	—	—	—
Meeting in New York (IUB Congress)	—	—	—	2 750	?	—	—	—	—
IV.2 Proteins	1 795	630	—	Commission dissolved					
IV.3 Clinical Chemistry	2 209	810	—	—	—	—	2 209	810	—
Symposium ? $ 2000 ?	6 452	3 330	360	2 950	—	460	6 657	2 700	460
		10 142			3 410			9 817	

* Note: As an approximate guide figures of 1963 have been stated

	Proposed Budget 1963			Proposed Budget 1964			Tentative Budget 1965*		
	Travel	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*
V. ANALYTICAL CHEMISTRY	$	$	$	$	$	$	$	$	$
Division Committee	3 036	630	1 200	—	—	1 500	3 036	630	500
V.1 Analytical Reactions	2 610	540	—	—	—	—	2 610	540	—
V.2 Microchemical Techniques	1 697	720	—	—	—	—	1 697	720	—
V.3 Nomenclature	1 234	360	—	—	—	—	1 234	360	—
V.4 Spectrochemical and other Optical Procedures	1 809	630	—	—	—	—	1 809	630	—
V.5 Electroanalytical Chemistry	1 051	540	—	—	—	—	1 051	540	—
V.6 Equilibrium Data	3 114	720	—	—	—	—	3 114	720	—
Working Committees									
"Teaching Analytical Chemistry" (limited to 3 persons), Paris				700					
"The use of radioactivity in analytical chemistry and the analyses of nuclear materials" (limited to 3 persons), Vienna				700					
	14 551	4 140	1 200	1 400	—	1 500	14 551	4 140	500
	19 891			2 900			19 191		

* Note: As an approximate guide figures of 1963 have been stated

		Proposed Budget 1963			Proposed Budget 1964			Tentative Budget 1965*		
		Travel	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*	*Travel*	*Subsistence*	*Administration*
VI.	APPLIED CHEMISTRY	$	$	$	$	$	$	$	$	$
	Division Committee	1 589	450	600	—	—	1 200	1 589	450	1 500
	ad hoc Committee for Chemical Engineering, Meeting in Paris	—	—	—	1 200	300	—	—	—	—
VI.1	Food Section	901	630	—	—	—	—	901	630	—
	Meeting in New York	—	—	—	5 184	800	—	—	—	—
	ad hoc Committee for Food Standards FAO/WHO, Meeting in Paris	—	—	—	703	60	—	—	—	—
	Survey of Food Additives	—	—	—	—	—	2 100	—	—	—
VI.2	Fermentation Section	1 837	720	—	—	—	—	1 837	720	—
	Meeting in London	—	—	—	1 000	300	—	—	—	—
	Representation (International Association of Microbiological Societies)	—	—	—	212	60	—	—	—	—
VI.3	Oils and Fats Section	571	540	600	—	—	600	571	540	600
VI.4	Water, Sewage and Industrial Wastes Section	871	540	—	—	—	—	871	540	—
	Meeting in . . . ?	—	—	—	871	540	—	—	—	—
VI.5	Toxicology and Industrial Hygiene Section	3 337	540	—	—	—	—	3 337	540	—
VI.6	Pesticides Section	2 181	540	—	—	—	—	2 181	540	—
	Meeting in Rome (if matters cannot be finalized by correspondence)	—	—	—	2 410	420	—	—	—	—
VI.7	Plastics and High Polymers Section	1 619	630	—	—	—	—	1 619	630	—
VI.8	Organic Coatings Section	1 283	720	—	—	—	—	1 283	720	—
	Compilation of reports	—	—	—	—	—	300	—	—	—
VI.9	Pulp, Paper and Board Section	1 241	630	—	—	—	—	1 241	630	—
		15 430	5 940	1 200	11 580	2 480	4 200	15 430	5 940	2 100
			22 570			18 260			23 470	

* Note: As an approximate guide figures of 1963 have been stated

GENERAL EXPENSES	tence		tration		tence		tration		tence		tration
	$	$	$	$	$	$	$	$	$
President	2 000	—	—	2 800	500	—	2 800	500	—
Secretary General	1 900	—	—	3 800	800	—	3 800	800	—
Treasurer	300	—	—	2 800	500	—	2 800	500	—
General Secretariat (including salaries, travel expenses of assistants, insurances, postage, etc.)	—	—	30 500	—	—	30 500	—	—	30 500
Translations	—	—	—	—	—	2 000	—	—	2 000
Premises and archives	—	—	—	—	—	2 000	—	—	2 000
ad hoc Committee on future activities	—	—	—	—	—	1 500	—	—	1 500
Finance Committee	—	—	1 500	—	—	500	—	—	500
Verkade Committee	—	—	1 500	—	—	—	—	—	—
Congress in Moscow (attended by the Executive Committee and the 6 Division Presidents)	—	—	—	—	—	—	3 700	1 300	—
Bureau meetings (Basle/Paris)**	4 620	2 160	—	8 360	1 320	—	8 360	3 520	—
Executive Committee meetings (Texas/New Delhi)	—	—	—	6 300	700	—	7 000	700	—
Division Presidents meeting (Paris)	506	—	—	—	—	—	1 368	280	—
Editorial Board meetings (London/Paris)	1 667	864	—	4 787	680	—	4 918	680	—
Scientific Editor	—	—	2 500	—	—	2 500	—	—	2 500
Butterworths (Royalties)	—	—	—	—	—	—	—	—	—
Comptes Rendus XXII	—	—	—	—	—	5 000	—	—	—
Information Bulletins	—	—	4 000	—	—	4 000	—	—	4 000
New Statutes (printing)	—	—	—	—	—	1 500	—	—	—
Taxes GB	—	—	1 200	—	—	—	—	—	—
2% ICSU contribution	—	—	1 600	—	—	2 000	—	—	2 000
"Councillors-at-Large"	5 144	1 053	—	—	—	—	5 144 ?	1 053 ?	—
ad hoc Committee on Teaching of Chemistry (to be reimbursed possibly by UNESCO)	—	—	2 000	—	—	3 000	—	—	3 000
	16 137	4 077	44 800	28 847	4 500	54 500	39 890	9 333	48 000
		65 014			87 847			97 223	

* Note: As an approximate guide figures of 1963 have been stated

** Expenditure will increase, if an additional representative of each Division will attend.

RECAPITULATION	Proposed Budget 1963 Travel	Proposed Budget 1963 Subsistence	Proposed Budget 1963 Administration	Proposed Budget 1964 Travel	Proposed Budget 1964 Subsistence	Proposed Budget 1964 Administration	Tentative Budget 1963* Travel	Tentative Budget 1963* Subsistence	Tentative Budget 1963* Administration
	$	$	$	$	$	$	$	$	$
PHYSICAL CHEMISTRY DIVISION	16 079	4 230	1 100	10 400	400	1 100	16 079	4 230	1 100
INORGANIC CHEMISTRY DIVISION	9 803	3 060	100	6 830	990	150	7 776	2 745	150
ORGANIC CHEMISTRY DIVISION	2 929	990	250	21 505	3 000	—	2 929	990	—
BIOLOGICAL CHEMISTRY DIVISION	6 452	3 330	360	2 950	?	460	6 657	2 700	460
ANALYTICAL CHEMISTRY DIVISION	14 551	4 140	1 200	1 400	—	1 500	14 551	4 140	500
APPLIED CHEMISTRY DIVISION	15 430	5 940	1 200	11 580	2 480	4 200	15 430	5 940	2 100
General Expenses	16 137	4 077	44 800	28 847	4 500	54 500	39 890	9 333	48 000
Transferred to reserves **			10 000			10 000			10 000
interest and dividends			6 000			6 000			6 000
To Union Bank of Switzerland } offsetting charge in the expense column***			5 000			5 000			5 000
To the Basle Chemical Companies } offsetting charge in the expense column***			50 000			50 000			50 000
	81 381	25 767	120 010	83 512	11 370	132 910	103 312	30 078	123 310
Grand Totals		227 158			227 792			256 700	

Contingencies for Conference in Paris in 1965: 7 000

* Note: As an approximate guide figures of 1963 have been stated.

** Decision of the Council: "The Union's financial reserves be gradually increased during a five to ten year period, by (i) crediting to the reserve account all income earned on the reserves, and (ii) transferring $10 000 annually from current income accounts to the reserve account.

*** A "realistic budget" was requested taking into account, and indicating under Income and Expenditure, all voluntary contributions such as those made by various organizations such as the Royal Society and travel support provided by countries that may do so in their own currencies, the

EDITORIAL ADVISORY BOARD

A meeting was held on July 4, 1963, at University College, London.

Present: Dr. H.W. THOMPSON (Chairman), Prof. B.C.L. WEEDON (Scientific Editor), Dr. R.S. CAHN, Dr. E.J. CRANE, Prof. W. KLEMM, Dr. E. KLEVER, Dr. L. MARION, Dr. R. MORF, Prof. P.E. VERKADE, and Dr. D.C. MARTIN (by invitation).

(1) The Chairman referred to the loss to the Board suffered by the death of Prof. NASINI.

(2) Reference was made to a statement by Dr. NOYES in "Bulletin" No. 18, June, 1963, concerning the constitutional position of the Editorial Board. This matter was referred to the Executive Committee for such action as might be necessary.

(3) The Chairman submitted a progress report for the past year, which included the following points:

(i) The revised form of contract agreed with Butterworths after the Montreal meeting in 1961 has made it possible to reprint freely in different languages a number of items which are regarded as essential international standards. For example, the atomic weight tables have been reprinted widely by many organizations and also advertised by industrial firms, and the nomenclature rules have also been reprinted widely. Special arrangements are also being made for the translation and reprinting of other articles. Acknowledgements are being made to the Union and its publishers in the agreed way.

(ii) Six volumes of the Journal have now been published, and the seventh is in preparation, as well as two supplementary numbers. There had, however, in some cases been serious delay caused by authors, and by confusion between the responsible officers of Sections and Commissions concerned. Such delays cause the Scientific Editor considerable inconvenience and lead to unjustifiable criticism of the Editorial Board.

About a dozen separately bound parts of the Journal had been issued for sale independently of the Journal, as well as reprints of special Commission reports.

(iii) The sales of the Journal plus sales of reprints amounted to an average of about 1600 per item, which, though not yet as high as could be wished, must nevertheless be regarded as substantial. Royalties paid by Butterworths to IUPAC for the years 1961 and 1962 amounted to about £4665 from which tax of £611 had been deducted, making a net contribution of £4054 (11275 dollars) to the Union's funds. An analysis of the sales distribution shows that there have been disappointing sales in the USA.

(iv) Considerable efforts have been made to obtain increased publicity. Butterworths have printed advertisement sheets in thousands for each of the separate publications and similar papers for the Journal as a whole. These have been distributed widely. Following requests to National Academies for address lists of potential buyers, such lists were received from a number of countries and have been followed up. Butterworths have sent out for review a large number of copies of each publication and lists of journals which were appropriate have been checked. These included scientific periodicals in the USA, where unfortunately almost no reviews have been obtained. An article on the IUPAC publications policy was published under the name of the IUPAC President in the Proceedings of the Chemical Society, and has since been translated in entirety or in essentials through the good offices of members of the Editorial Board in Holland, Germany and Switzerland, but we have been unable to get this article published in the

USA. Recently, a review of the first six volumes of the Journal Pure and Applied Chemistry was printed in the Proceedings of the Chemical Society, London, and arrangements have now been made to supply proofs of all articles in the Journal to Chemical Abstracts, so that references can be included. A series of articles on IUPAC have recently been printed by Chemistry and Industry, and will be distributed to all participants at the London Conference and Congress.

Perhaps the only other immediate action which might lead to increased publicity and sales would be individual action by members of the Board in their own countries.

(v) Future commitments include the main lectures of the following Symposia: Spectroscopy (Tokyo 1962), Thermodynamics and thermochemistry (Lund 1963), Fungi and Yeast (Dublin 1963), Organic Natural Products (Kyoto 1964), and the London Congress (1963). In addition, a number of Commission reports are expected, and arrangements have been made to publish Experimental Thermodynamics, Vol. I.

(vi) The Editorial Board owes a great debt to Prof. WEEDON, the Scientific Editor, for his patient and skilful handling of many problems, and also to its publishers Butterworths for their co-operation.

In Accepting the Chairman's report, the Board agreed

(a) that repeated attention should be drawn to the difficulties caused by authors and others responsible in the preparation of manuscripts and in the returning of proofs,

(b) to investigate the possibility of avoiding U.K. tax on sales, and

(c) to ask American members to attempt to obtain greater publicity and sales in the USA.

(4) The Scientific Editor's report included two important points:

(i) Documents were as a rule being published some 7 to 8 months after receipt.

The FEITKNECHT report had been published 7 months after receipt of the manuscript. The papers from the Stockholm, Prague and Florence Symposia were published 10, 9 and 8 months respectively after the meetings had been held, late submission of some manuscripts and the poor state of others causing some delays. The Tokyo papers had been badly delayed and would not appear until next September, 12 months after the meeting. The DUYCKAERTS report had been held up for many months while authors checked proofs and drawings. The authors of the Oils and Fats report had requested extensive alterations, with considerable extra expense.

The Board congratulated the Editor and Publishers on the average speed of publication in face of these difficulties.

(ii) The system of allowing those attending a Symposium to place orders in advance for copies of the special reprint at a reduced price had worked admirably at Prague and Florence. Prepublication orders for the London 1963 Congress lectures already amounted to 700 (this figure rose to 800 during the Congress). On this occasion the purchasers paid for the reprints either before the meeting, or on registration at the Congress. An official request for the wider adoption of this procedure should be made. Even greater savings to individuals would be achieved if the organizers of a symposium were to place a bulk order; a procedure of this type was used at Stockholm.

(5) The following arrangements were made with regard to future symposia:

(i) Fifth International Symposium on Reactivity of Solids, Munich, 1964. This is expected to involve five plenary lectures and seventy other lectures, some 1000 pages in all. The Board discussed this in relation to its general

principles of publication, and also as regards the increasing doubts about the desirability of complete publication of Symposia in general. It was decided that IUPAC might wish to publish the plenary lectures, but that the Chairman and Editor should settle this matter with Prof. Schwab.

(ii) High Temperature Technology, Stanford 1964. It was agreed that this should be printed as a supplementary volume, containing the main lectures and the minimum and essential parts of the discussion. Publication of this discussion was to be regarded as exceptional, and without prejudice to future cases, and the organizers of the Symposium were asked to co-operate in selecting only the important parts.

(iii) Organic Photochemistry, California 1964. Further information was awaited on this interesting proposal.

(iv) Co-ordination Chemistry, Symposium, Vienna 1964. It was decided to publish the invited lectures.

(v) Isotope Mass Effects in Chemistry and Biology, Vienna 1963. Publication was approved in principle, pending discussion of details between the Editor and the organizers of the meeting.

(vi) Organic phosphorus Compounds, Heidelberg. Further details were required.

(6) A proposal from the Applied Chemistry Section to publish a Trilingual Glossary was not accepted.

(7) It was agreed that if a further translation of the Atomic Weight Report in French were needed, it should be published in the Bulletin or Comptes rendus.

(8) It was decided that any reports on the teaching of chemistry should be published, if necessary, in the Bulletin or Comptes rendus.

(9) It was agreed that changes would now be necessary in the membership of the Editorial Board, and this matter was left to the Chairman and Dr. Morf, for consideration after the election of new Officers of IUPAC.

PUBLICATION OF CONGRESSES AND SYMPOSIA

The Union reserves the right to publish the whole or part of the proceedings of any symposium which it sponsors. As a decision on sponsorship is only taken after the question of publication has been carefully considered, the Editorial Advisory Board requires advance information about symposia. Organizers of meetings who are considering making an application to the Union for sponsorship should therefore supply the information requested on the back of the questionnaire as soon as possible to the Chairman (Dr. H. W. Thompson, St. John's College, Oxford, England) and the Scientific Editor (Prof. B.C.L. Weedon, Queen Mary College, Mile End Road, London E.1).

It is customary for organizers to provide facilities for participants to order copies of the proceedings at, or before, the symposium. Substantial discounts are offered by the Union's publishers on such advance orders.

Attention is drawn to "Notes to Union Officers" and to "Notes to Contributors" which are published periodically in *Pure and Applied Chemistry*. Reprints of these notes may be obtained from the Scientific Editor.

(1) Title of Congress or Symposium, with sub-divisions if any:

(2) Commission, Section or Division sponsoring meeting:

(3) Date and place proposed:

(4) Approximate number of participants expected:

(5) Number of papers to be presented, and approximate length:

(6) Number of specially invited lecturers, if any:
Names of probable invited lecturers:

(7) Has financial help from the Union been requested?

(8) In the event of the Union not wishing to publish the proceedings, will the organizers wish to make other publication arrangements?

(9) What arrangements have been made for the collection of manuscripts?

By what date?

Copies of these forms can be obtained from the Secretary General, Dr. Rudolf Morf, c/o. F. Hoffmann-La Roche & Co. Ltd., Basle 2 (Switzerland).

PUBLICATION DES COMPTES-RENDUS DE CONGRÈS ET SYMPOSIUM

L'IUPAC se réserve le droit de publier intégralement ou partiellement les comptes rendus de tout congrès ou symposium dont elle assume le patronage. Une décision sur l'accord d'un patronage n'étant prise qu'après un examen minutieux de la question des publications, le Comité de Rédaction a besoin d'être informé suffisamment à l'avance sur les symposiums en préparation. Les organisateurs de symposiums qui ont l'intention de demander le patronage de l'IUPAC devront par conséquent faire parvenir préalablement au Président du Comité de Rédaction (Dr. H. W. Thompson, St. John's College, Oxford, Angleterre) et au Rédacteur scientifique en chef (Prof. B. C. L. Weedon, Queen Mary College, Mile End Road, London E.1, Angleterre) tous les renseignements nécessaires en se servant du questionnaire ci-après.

Il est d'usage que les comités organisateurs offrent aux participants la possibilité de commander des comptes rendus durant ou avant les symposiums ou congrès. L'éditeur de l'IUPAC accorde des escomptes considérables si les commandes sont passées à l'avance.

Nous attirons votre attention sur les «Note to Officers» et «Note to Contributors» parues dans le Bulletin d'Information et qui sont également publiées périodiquement dans le journal «Chimie Pure et Appliquée». Des tirés à part peuvent en être commandés auprès du Rédacteur scientifique en chef.

1° Titre du Congrès ou du Symposium, avec indication des subdivisions, s'il y a lieu.

2° Commission, Section ou Division assumant le patronage

3° Date et lieu proposés

4° Nombre approximatif des participants attendus

5° Nombre des travaux présentés, longueur approximative

6° Nombre et noms des conférenciers invités et, si possible, indication du titre des conférences

7° Une contribution financière de la part de l'IUPAC est-elle demandée ?

8° Quelles dispositions ont-elles été prises pour la compilation des manuscrits ? à quelle date ?

9° Si l'IUPAC ne désire pas se charger de la publication des comptes rendus, les organisateurs souhaitent-ils que d'autres dispositions soient prises pour la publication des comptes rendus ?

Ces questionnaires peuvent être obtenus auprès du Secrétaire général, Dr Rudolf Morf, c/o. F. Hoffmann-La Roche & Cie. SA, Bâle 2 (Suisse).

AGENDA FOR THE XXIInd IUPAC CONFERENCE COUNCIL MEETING

London, July 1963

(1) Approval of the Minutes of the Montreal Meeting

(2) Extraordinary Resolution applicable to the elections in 1963 (Appendix B-Tokyo Minutes)

(3) Approval of the new Statutes, specific Resolutions with regard to XII

(4) Approval of new By-Laws

(5) Announcement of nominations for new Officers and Bureau Members

(6) Announcement of the time of Elections

(7) Adhering Organizations
(a) Approval of new members: Korea and Viet Nam
(b) Approval of change in category: India, Australia and Finland

(8) Statutory Report of the President

(9) Ratification of the appointment of the Finance Committee

(10) Ratification of the appointment of the Drafting Committee

(11) Biennial Report of the Treasurer, comments of the Finance Committee

(12) Budget for 1964 and Tentative Budget for 1965

(13) Ratification by Council of the decisions taken by the Bureau since the XXIst Conference

(14) Adoption of the Division Presidents' Reports

(15) Proposal of Tentative Nomenclature Rules

(16) Report of the Division Presidents on the results of the Conference

(17) Reports of the Finance Committee

(18) Elections

(19) Teaching of Chemistry

(20) Chemical Technology

(21) Co-operation and association with the United Nations Agencies

(22) Date and place of the XXIIIrd Conference and the XXth Congress

(23) Any other business

MINUTES OF THE COUNCIL MEETINGS

held in London from July 5 to 9, 1963

July 5, 1963—2 p.m. Open Meeting
3.30 p.m. Closed Meeting
July 6, 1963—Morning
July 9, 1963—Full day

Present: President WILLIAM ALBERT NOYES, Jr. (in the Chair), Members of the Bureau and Delegates of the Adhering Organizations (see page)

All formalities to enable the Council to make valid decisions had been carefully fulfilled. Bureau Members and the members of the Adhering Organization had been invited by the Secretary General, with a registered letter dated December 28, 1962. A draft agenda had been enclosed with this invitation and the invited members were requested to propose additional items. In particular, attention was drawn to Item Nos. 3 and 4 with regard to the new Statutes and the new By-Laws and Item No. 18, regarding Elections.

The first draft of the proposed new Statutes was circularized in December, 1962, a French translation of a project of the new Statutes labelled July, 1962. This translation was made by the courtesy of the French National Body as requested by the Secretary General on September 21, 1962. The English version of the proposed new Statutes was circularized later; according to the old Statutes six months before the Council meeting.

The President's Report on the General State of the Union was distributed together with the Report of the Hon. Treasurer which also included the Report of the Auditors. These documents were dispatched four months before the Council meeting in English and in French.

The *ad hoc* Finance Committee was given the opportunity to visit the Union's Bankers in Switzerland and to check the accounts in the smallest detail.

On May 22, 1963 (ref: 9147) a circular letter regarding elections with all nominations for the Bureau, etc., was circularized with the final Agenda for the Council Meeting which took care of all the comments received.

To make a very clear situation with regard to the proposed new Statutes and By-Laws, the President decided that a draft of the proposed new Statutes—taking care of all the comments received in the meantime—be printed on special paper in draft and submitted to the Bureau and Council in London.

The Reports of the Section Presidents (Division Presidents according to the new Statutes) have been distributed before the Conference in London.

These Minutes have been circularized already in draft among the members of the Adhering Organizations, Members of the Bureau and Finance Committee and comments received have been duly incorporated.

Minute 1 *Approval of Minutes*

The minutes of the Montreal meeting were approved and accepted.

Minute 2 *Election Procedure*

The resolution applicable to elections during the 1963 Conference was approved and accepted.

Minute 3 *Adoption of New Statutes*

The Council approved the acceptance of the new Statutes in principle. The French delegation were prepared to accept these as presented in draft with the proviso that they be permitted to

formulate modifications relating to a number of points within the next six months for consideration by the Executive Committee and Bureau at their next meeting, and that the consequential recommendations should be submitted to the Council for consideration as amendments at the next meeting in 1965. The chairman proposed that any other changes suggested by the delegates be dealt with in the same manner.

Resolved: That the Statutes as presented be accepted with the following minor changes:
Statute V C 2 (b) page 3, lines 24–25 *delete:* "Abstentions... votes."
Statute V C 1 page 2, line 42 *add*: "Abstentions shall not be recorded as votes."

Language for Minutes of Meetings: arising from Statute V D (d)
Resolved: That the minutes of the meetings of the Council, Bureau, and Executive Committee shall be recorded in English for the next four years, 1963–67.

Minute 4 *Adoption of Draft By-Laws*

The draft By-Laws were unanimously accepted. Relating to By-Law Xi B 1, paragraph 1, the UK delegation proposed that the permissible number of associate members on each Commission be increased to six. After debate it was resolved that this suggestion be put to the Bureau and Executive Committee later.

Minute 5 *Nominations for Elections to the Bureau*

The list of members nominated for election to the Bureau, was announced. The Chairman brought to the attention of the Council that, on the resignation of Prof. Nabuco de Araujo, the Bureau had unanimously proposed Prof. V. Deulofeu (Argentina) as a nominee to ensure an even geographical distribution. Statute VII B provides that the Council shall elect not less than ten members to the Bureau. The Executive Committee proposed that twelve members should be elected.
Resolved: That there shall be twelve elected members of the Bureau for the next biennium in addition to the Officers of the Union.

Minute 6 *Date and Time of Elections*

The election of new officers and Bureau members was fixed for Tuesday, July 9, at 11.00 a.m.

Minute 7 *Adhering Bodies*

(a) On the application of South Korea and Viet Nam for membership in the Union.

Resolved: That South Korea and Viet Nam be elected to membership in Category C.

(b) On the application of Australia, India and Finland for change in membership category

Resolved: That the Council approves the change in category of the following member countries:

Australia	from Category B 1	to Category A 1
Finland	from Category C	to Category B 1
India	from Category C	to Category B 2

Minute 8 *Statutory Report of the President on the State of the Union.*

The President invited comments on his Report which had been distributed previously.
Resolved: That the Report of the President be received.

Minute 9 *ad hoc Finance Committee*

Resolved: That Council approve the appointment of an *ad hoc* Finance Committee to look into and verify the accounts of the Union with membership as follows:
P. ARNOLD (USA), Prof. JOHN C. BAILAR, Jr. (USA), Dr. C.O. GABRIELSON (Sweden), Prof. O. HORN (Germany), J. GIVAUDON (France), Prof. D. MAROTTA (Italy)

Minute 10 *Ratification of Appointment of a Drafting Committee*

Resolved: That a drafting committee be appointed with the following membership:
Dr. J.S. ANDERSON (England), Prof. W.A.E. MCBRYDE (Canada)
The French delegation emphasized and the President concurred that the final responsibility for the correctness of the Minutes lies with the Secretary General.

Minute 11 *Biennial Report of the Honorary Treasurer*

Resolved: That the biennial report of the Honorary Treasurer be accepted with thanks.

Minute 12 *Budget for 1964 and Tentative Budget for 1965*

The Secretary General stated that a Budget for 1964 would be difficult to establish at this stage, as the Divisions had not presented their report on future activities. The Budget will be prepared by the Executive Committee when prospective expenditure is known, and will be submitted in September. The Budget for 1965 can be more firmly established, as the main activities of the Union are known for that year.

Resolved:

(I) That the Council approve the estimates of income.
(II) That the Executive Committee shall compile details of the budgetary estimates before the end of the year 1963.

Minute 13 *Ratification by Council of decisions taken by the Bureau since the XXIst Conference*

Resolved: That the Council approve the decisions taken by the Bureau since the XXIst Conference in Montreal in 1961.

Minute 14 *Reports of Division Presidents*

Reports by Presidents of Divisions, Sections and Commissions relating to future activities are to be approved by the Council only in principle. If these reports and suggestions on future activities have any financial implications a final ratification must be made at a subsequent Bureau meeting which should approve or decide otherwise in the light of the advice of the Treasurer regarding financial implications.
Division Presidents are invited to give due consideration to the financial implications and discuss the details with the Treasurer prior to their statement to the Council.
Following the procedure at the XXIst Conference and in accordance with the new draft Statutes X-1 the reports of the Division

Presidents had been circulated. Each Division President gave a brief outline on the work carried out by his Division since the last meeting of the Council.

Dr. H.W. Thompson (England) gave a progress report on the work of the Union's Editorial Board.

Resolved: That all six reports of the Divisions and that of the President of the Editorial Board be accepted.

Minute 16 *Reports of the Division Presidents on the results of the Conference*

Reports from each Division were given by the respective Presidents. For purposes of these minutes only those actions requiring formal approval of Council have been recorded.

Physical Chemistry

(1) It was agreed that a recommendation be forwarded to the International Commission on Weights and Measures that appropriate action be taken to redefine the litre as equal to one cubic decimetre.

(2) It was agreed in principle that the Commission on Symbols and Terminology be authorized to revise the Manual on Physicochemical Symbols and Terminology. The Commission was instructed to pay particular attention to the definition of the *mole* as a unit of quantity of substance and to the adoption of the abbreviation *mol* proposed by IUPAP.

(3) It was agreed that the Commission on Thermodynamics and Thermochemistry be authorized to solicit funds from outside the Union to finance setting up a task group to prepare and publish a set of Tables of Thermochemical Data for Industrial Gases.

(4) It was agreed that the Physical Chemistry Division should retain its existing Commissions for four years.

(5) A recommendation to send an IUPAC representative to the IUPAP Commission on Nuclidic Masses was referred to the Executive Committee.

Inorganic Chemistry

(1) It was agreed that the Inorganic Chemistry Division should retain each of its four existing Commissions for two years.

Organic Chemistry

(1) It was announced that the Commission on Codification of Data would be dissolved. The Council agreed to retention of the Commission on Organic Nomenclature.

Analytical Chemistry

(1) The Council agreed to distribution of the Fifth Report on Inorganic Reagents and Reactions to all adhering organizations for approval prior to publication.

(2) Approval was given to publication of a report entitled "Test Compounds for the Microdetermination of Oxygen in Organic Compounds".

(3) It was agreed that all Commissions in this Division should be renewed for four-year periods.

Biological Chemistry

(1) Approval was given to a plan under which the Commission on Nomenclature of Biological Chemistry will meet and act together with the corresponding Commission of the International Union

of Biochemistry. Each Commission will continue to serve and be responsible to the Union through which it was appointed. Each Commission will have five members. A member of the IUPAC Commission will be selected as first President of the combined Commissions, and a member of the IUB-Commission as the first Secretary. It was agreed that the Commission on Nomenclature of Biological Chemistry be renewed for four years under the foregoing conditions.

(2) It was announced that the Commission on Proteins would be dissolved. It was agreed that the Commission on Clinical Chemistry be renewed for four years.

Applied Chemistry

(1) It was announced that the Commission on Fermentation Industries would be dissolved. The report of the determination of fusel oils is to be issued within six months.

(2) It was announced that the Commission on Food is shortly to issue its report on methods of analysis for traces of metals and will then dissolve.

(3) It was agreed that a small committee consisting of the Secretary General, and the Presidents of the Division of Analytical, Applied, and Physical Chemistry, would consult with representatives of WHO and FAO regarding the preparation of an International Codex Alimentarius with particular assistance to be given in areas of chemical interest.

In addition to the foregoing, approval was given to the membership of the executive for each of the foregoing divisions, and to changes in membership in commissions as given by the respective Division Presidents.

The reports of the Division Presidents also included announcements of a number of forthcoming symposia to be held under auspices of the Union.

(a) Symposium on Macromolecules, Prague, 1965; approved subject to no objection from the National Academy of Sciences, USSR, who will be organizing the XXth Congress.

(b) Symposium on Properties of Solids at High Temperatures, Paris, 1965; approved subject to same proviso as (a).

(c) VIIIth Conference on Co-ordination Chemistry, Vienna, 1964; approved.

(d) Symposium on Organo-metallic Compounds, USA, 1965; approved provisionally.

(Financial support for this is expected from two bodies outside the Union, and there was some inconclusive discussion of what the Union's role should be in it.)

(e) Symposium on Free Radicals—Gomberg Centenary Symposium, Michigan, 1966; approved.

(f) Symposium on Organo-phosphorus Compounds, Heidelberg, 1964; approved.

(g) Symposium on Alicyclic Compounds, Prague, 1966, approved.

Minute 17 *Report of the Finance Committee*

Resolved: That the Council, in adopting the report of the Finance Committee, approve the following recommendations contained in the report.

(1) That restrictions on the Union's investment policy be removed and that, with the concurrence of the Executive Committee, the Union's bankers be empowered to invest in stock other than fixed interest securities and the chemical industry.

(2) That funds now held in the United Kingdom be removed to some other location, where they are free of tax.

(3) That, as was recommended at the XXIst Conference in Montreal, one or more persons should be appointed in each adhering country to devise and implement ways of raising additional contributions from industry.

(4) That the Editorial Committee should give consideration to the present small circulation of the Union's publications and adopt means to obtain a larger income from publications.

(5) That the procedure outlined in Minute 153 of the 47th Meeting of the Executive Committee in Montreal, 1961, be implemented in order to achieve more realistic budgeting.

(6) That the Union's reserve funds be gradually increased over a period of 5–10 years, (a) by crediting to the reserve account the interest earned on the reserves and (b) by transferring $10000 per year to the reserve fund.

(7) That in place of the present arrangements for *ad hoc* Finance Committees a standing Finance Committee, of not more than five members, be set up to advise the Bureau and Executive.

(8) That the Executive and Bureau should give closer consideration to achieving economy in the operation of the Union, in that the new Statutes should give a better control of the Union's Commissions.

(9) That two new categories of membership be set up: Category A-4, with a minimum annual contribution of $25000, and Category D, with a minimum annual contribution of $100.

It was also *resolved* that an expression of gratitude be sent to Sir Charles Dodds for his services as Honorary Treasurer of the Union.

Minute 18 *Elections*

Nominations for the elections had been invited from the adhering bodies in a letter (No. 8310) dated December 28, 1962. All nominations received up to May 4, had been listed and circulated amongst the adhering organizations, together with short biographies of the candidates.

The President announced that: (a) The procedure to be followed in the Elections had been announced in "Information Bulletin" No. 18. A letter (No. 9147) dated May 22, 1963, to all adhering bodies, had called for approval of this procedure and relevant suggestions. The recommended procedure was *adopted*. (b) With the decision that the Bureau should have 12 elected members (Minute 5), *ten* places on the Bureau had to be filled by election.

The results of the voting were:

	For/Yes	*Against/No*
President: Lord Todd	138 votes	—
Treasurer: Prof. Bailar	138 votes	—
Secretary General: Dr. Morf	126 votes	8 votes

Vice-President	*For/Yes*
Prof. W. Klemm	100
Prof. V. Kondratiev	36
Members of the Bureau	
Prof. V. Kondratiev	124 (4 years)
Dr. H. W. Thompson	136 (4 years)
Prof. S. Mizushima	130 (4 years)
Dr. A. Rees	130 (4 years)
Prof. J. Lecomte	128 (4 years)
Dr. C. O. Gabrielson	120 (2 years)
Prof. V. Deulofeu	118 (2 years)
Prof. Verkade	102 (4 years)
Prof. D. Marotta	98 (2 years)
Prof. D. Ginsburg	78 (2 years)

Prof. O. Wichterle and Dr. T. Govindachari continue as members of the Bureau for the next two years.

The term of office was determined by drawing lots.

Minute 19 *Teaching of Chemistry*

In response to a request from UNESCO for assistance in meeting the problems of teaching Chemistry in different parts of the world, the Executive Committee and the Bureau have discussed the teaching of chemistry. The President drew a distinction between the problems, and the methods of dealing with them, in countries where chemistry and scientific activities generally are well established and in an advanced stage, and the problems involved for countries where scientific and technological activities are just commencing.

Resolved: That the Bureau and Executive Committee be empowered to appoint a committee to consider in what way the Union can assist UNESCO in framing recommendations for the teaching of chemistry. Council did not closely specify the terms of reference of the committee.

Minute 20 *Chemical Technology*

Prof. Truhaut proposed that a committee should study the relation between the interests of the Union (and of the Division of Applied Chemistry in particular) and the subject of Chemical Engineering, and that the advice and participation of Chemical Engineers should be sought where it was relevant to the activities of Commissions.

Resolved: That the Committee of the Applied Chemistry Division be empowered to set up an *ad hoc* committee to explore the possibility of liaison between the Union and the subject of Chemical Engineering.

Minute 21 *Co-operation and association with United Nations agencies*

Requests have been received from WHO, FAO and IAEA for co-operation with the Union wherever chemical problems may be involved. The Bureau has taken and can take appropriate steps for such co-operation; no formal action is required on the part of the Council.

Minute 22 *Date and Place of XXIIIrd Conference and XXth Congress*

(a) An invitation had been sent on April 27, 1963, to the President from the President of the Academy of Sciences of the USSR to hold the XXth Congress in Moscow in 1965.

Resolved: That the XXth Congress be held in Moscow in 1965. There was an agreement reached whereby the delegates from the USSR will endeavour to assist in the admission to Russia of scientists who might encounter difficulties on political grounds in gaining admission to attend the Congress.

(b) The delegates from France extended an invitation for the XXIIIrd Conference to be held in Paris.

Resolved: That, pending an official letter from the Comité National de la Chimie de France, the Council approve holding the XXIIIrd Conference in Paris, in 1965.

Minute 23 (a) *Future Activities of the Union*

Resolved: That a committee be set up to consider the future activities of the Union, the members of the Committee being nominated by the Officers.

23 (b) *Report of a Special Committee on the problem of restricted travel*
Arising from discussions in Council on July 6, the President had appointed a special committee, consisting of representatives from the USSR, Israel, the United Arab Republic, Hungary and the United Kingdom, to consider the freedom of access of scientists to all countries in which future meetings of the Union might be held. Dr. H. W. THOMPSON (England) presented the report of the committee in the form of a resolution.

Resolved: That this Council records its unanimous view that working scientists from any member country should not be prevented by restriction of travel from attending meetings organized under the auspices of the International Union of Pure and Applied Chemistry, and that all possible practical steps should be taken towards this end.

23 (c) *Resolutions from the Bureau*

Since the description "affiliated organization" does not exist in the new statutes, the position of organizations so designated in the past must be considered afresh. In order that this might be done in due order and with the minimum of disturbance the Bureau proposed the adoption of the following resolutions by Council.

Resolved:

(1) That those organizations hitherto described under the 1957 Statutes as "affiliated organizations" be given the status of "associated organizations" for two years; i.e., until the end of the 1965 Conference of the Union.

(2) That any of these organizations wishing to have the status of "associated organizations" after the Conference of the Union in 1965 be required to forward to the Secretary General of IUPAC before December 31, 1963, an application for association giving full particulars of the organization, its aims and general structure. Such applications shall be considered by the appropriate Division Committees who will submit their observations to the

Bureau not later than March 1, 1964. The recommendations of the Bureau regarding the applications shall be submitted to the Council for final decision at the 1965 Conference.

Minute 24 *Vote of thanks*

With acclamation, a vote of thanks was expressed by Lord TODD, to the outgoing President, Prof. WILLIAM ALBERT NOYES, Jr., who continues for another two years as a member of the Executive Committee. As requested by the Finance Committee, a vote of thanks was extended to the Hon. Treasurer Sir CHARLES DODDS. To our British hosts, thanks were expressed for their invitation, their hospitality and for all the facilities made available to us during the Conference in London.

AGENDA FOR THE 15th BUREAU MEETING

London, July 1963

(101) Finalization of the Agenda

(102) Minutes of the 14th Bureau Meeting

(103) ICSU Future Structure: Instructions to IUPAC Representatives

(104) Commission on Colloid and Surface Chemistry—9 members

(105) Co-ordination of Tables of Thermodynamic Properties of Gases

(106) Report on the work of the Technical Committee—ISO/TC 12

(107) Co-operation ISO/IUPAC

(108) International Conference on Co-ordination Chemistry, Vienna

(109) Food Division—New Commission to deal with selenium, boron and fluorine

(110) Subjects for Symposia and Congresses

(111) Any other business

MINUTES OF THE 15th BUREAU MEETING

held in London, July 1963

July 4, Morning and Afternoon
July 5, Morning
July 10, Morning

Present	Prof. W. A. Noyes, Jr., President,	Prof. R. Tourky
	Sir Charles Dodds, Treasurer	Prof. P. E. Verkade
	Dr. R. Morf, Secretary General	Prof. O. Wichterle
	Lord Todd	Prof. G.-M. Schwab
	Prof. W. Klemm	Prof. H. J. Emeléus
	Prof. V. Kondratiev	Prof. H. Erdtman
	Prof. M. Letort	Prof. W. M. Sperry
	Dr. T. Govindachari	Prof. H. Malissa
	Prof. D. Marotta	Dr. J. H. Bushill
Excused	Prof. A. Tiselius	Prof. A. Stoll
Resigned	Prof. C. E. Nabuco de Araujo	

Newly-elected Bureau Members also present on July 10, 1963

Prof. V. Deulofeu	Dr. A. Rees
Dr. C. O. Gabrielson	Dr. H. W. Thompson
Prof. D. Ginsburg	Prof. J. de Boer
Prof. J. Lecomte	Prof. L. Marion
Prof. S. Mizushima	Prof. R. Truhaut

Introduction

The Bureau and the Executive Committee discussed the entire Agenda prior to submitting it to the Council. In order to simplify the records and to avoid endless repetitions, only those resolutions made by the Bureau and the Executive Committee specifically are listed hereafter and are not referred to in the Council Minutes.

With regard to the Bureau Minutes, it must be borne in mind that a very short constituted meeting was held again after the Council meeting, on July 10, 1963

Minute 1 *Agenda*

Resolved: That the Agenda as circulated by the Secretary General prior to the meeting, be approved and accepted.

Minute 2 *Minutes of the Bureau Meeting held in Brussels*

Resolved: That the Minutes of the 14th Bureau Meeting held in Brussels be approved and accepted.

Minute 3 *ICSU Future Structure*

Prof. Noyes gave the meeting details on the history of ICSU and the work it has carried out since its inception. He stressed the importance of a strong ICSU for the benefit of the Unions.

Resolved: That the Bureau being in favour of a strong ICSU supports the proposals put forward by the ICSU Committee on the Future Structure. The Bureau therefore recommends that

the IUPAC representatives should support these proposals at the meeting of the ICSU and should any amendments be proposed at that meeting, our representatives should be guided in their attitude to them by the above expressed feelings of the Bureau that ICSU should be strong.

Minute 4 *Commission on Colloid and Surface Chemistry*

Resolved: That the Bureau approve the composition of 9 members in the Commission on Colloid and Surface Chemistry (as an exception to the rules).

Minute 5 *Co-operation with International Agencies and with International Standards Organizations*

It was the unanimous opinion of the Bureau that the Secretariat in Basle be strengthened sufficiently to handle these problems.

Resolved: That the Secretariat in Basle be strengthened by an additional Scientist who would either answer the queries directly or transmit them to the appropriate Divisions concerned who would in turn reply to the best of their ability. This would be a tentative arrangement till such time wider fields could be explored to handle this problem. The Presidents of the Divisions of Applied, Physical and Analytical Chemistry would discuss this matter in detail at the next ISO meeting in October 1963.

Minute 6 *Sponsorship*

Resolved: That

(a) Sponsorship should not be granted to any particular meeting unless an application is made through the Division Committee, at least two years before the meeting.

(b) In particular, we do not approve of sponsorship to any meeting which is organised by a body not incorporated in one way or the other in the structure of IUPAC.

(c) Sponsorship involving financial support be given to only those Symposia and meetings organized by the Divisions themselves.

Minute 7 *Food Division – New Commission*

Dr. Bushill asked the Chair for agreement on a Commission in the Applied Chemistry Division to deal with the toxicity, evaluation methods of analysis and tolerable limits of selenium, boron and fluorine.

Resolved: That agreement be given to such a Commission being formed.

Minute 7 *Subjects for Symposia and Congresses*

The Future Activity of the Union was discussed at length and the Division Presidents were requested to send their suggestions to the Secretary General.

New Bureau Meeting - July 10, 1963

Lord Todd took the Chair and elections were held for members on the Executive Committee. The following members were elected: Prof. V.N. Kondratiev, Dr. A.L.G. Rees, Prof. P. Verkade.

Minute 8 *The Finance Committee*

It was unanimously decided to have a permanent Finance Committee.

Resolved: That a permanent Finance Committee be appointed by the President, Lord TODD and this committee circulate a report to the Bureau.

Minute 9 *Next Meeting*

Resolved: That the next Bureau Meeting be held in March 1964 in Basle. The dates to be finalized by the Secretary General.

AGENDA FOR THE 52nd MEETING OF THE EXECUTIVE COMMITTEE

London, July 1963

(201) Finalization of the Agenda

(202) Minutes of the 51st Meeting held in Cairo

(203) Decision with regard to Travel and Subsistence Allowance

(204) Turkey-Dollar exchange difficulties, annual subvention to be reduced

(205) Detailed programme for additional meetings of Bureau and Council

(206) Atomic Weights Commission—letter from Dr. GUÉRON dated March, 18 to Prof. EMELÉUS

(207) Next meeting to be held in Australia, April 1964, (letter dated April 4, 1963)

(208) Tables of Constants

(209) ISO: TC 12 and TC 47

(210) Any other business

MINUTES OF THE 52nd EXECUTIVE COMMITTEE MEETING

held in London, July 1963

June 29, Morning and Afternoon
June 30, Morning and Afternoon
July 10, Morning

Present Prof. W. A. NOYES, Jr. (President), Sir CHARLES DODDS, Treasurer, Prof. V. KONDRATIEV, Prof. W. KLEMM, Prof. M. LETORT, Dr. R. MORF, Secretary Gen, Lord TODD

Invited Prof. John C. BAILAR, Jr.

Introduction

The Executive Committee discussed the agenda for the Bureau and Council Meetings and the Minutes hereafter are confined to those matters which were dealt with exclusively by the Executive Committee.

Minute 235 Agenda

Prof. NOYES whilst opening the Meeting asked the members for approval on the sequence of the items listed in the Agenda.
Resolved: That the Agenda be approved as presented.

Minute 236 Minutes of the 51st Meeting

Resolved: That the Minutes of the 51st Meeting of the Executive Committee held in Cairo be approved.

Minute 237 Travel and Subsistence Allowance

The list of payments for the London Conference, as submitted by the Treasurer, was approved. It was suggested that in order to have a set limit for travel allowance, only the quickest and the cheapest fares (round-trip economy class by air) be paid to Titular Members. Any difference in fares to be borne by the member concerned.
Resolved: That the Travel and Subsistence Allowance list be approved as submitted. Hereafter IUPAC pay the round-trip economy class air fares to Titular Members. Any difference therefrom to be borne by the member.

Special Clause: For Division of Applied Chemistry, two Secretaries claimed travel and subsistence allowance for the London Conference and as a very special case this was allowed provided that the Division would amend its by-laws to have two Secretaries. In the meantime, it was approved to pay also the travel and subsistence allowance for the two new Secretaries of this Division.

Minute 238 Application for annual subvention to be reduced – Turkey

The Committee decided that making a special case of this issue would possibly lead to a dangerous financial situation. It was therefore decided that Turkey be transferred to a lower category.
Resolved: That Turkey be transferred to Category D.

Minute 239 Atomic Weights Commission

A letter dated March 18, from Dr. GUÉRON to Prof. EMELÉUS was discussed and the meeting decided that the Commission should not be dissolved but its membership be reduced and that the International Union of Pure and Applied Physics be invited to co-opt two members for this Commission.

At this stage, the controversy over "Atomic Weights" or "Atomic Masses" was referred to. The meeting was in agreement with the Committee of the Inorganic Division to retain the title as "Table of Atomic Weights".

Resolved: That the Commission on Atomic Weights be maintained with a reduction in its membership and a possible co-ordination with IUPAP by co-opting two members for this Commission (Secretary General to act).

Minute 240 Affiliation

This subject was discussed in light of the new Statutes. Regarding CITCE it was decided that the advice of Prof. SCHWAB, President of the Physical Chemistry Division, should be taken and a decision made thereafter. The Physical Chemistry Division has a Commission on Electrochemistry with three Sub-Commissions. Prof. KONDRATIEV suggested that there were two solutions with regard to CITCE. Either to assimilate it in our Commission or to ignore it completely.

Regarding the Congress on Catalysis, it was decided that this matter be referred to Sir ERIC RIDEAL (Secretary General to act).

Minute 241 Relations with ISO

Resolved: That the relations with ISO be strengthened and a delegation be sent to its next meeting in Paris.

NOTE FROM THE EXECUTIVE COMMITTEE

re: Co-operation with other International Organizations

The item "Co-operation ISO/IUPAC" on the Bureau agenda raises an important general matter for consideration. In recent years a number of international organizations—notably the United Nations specialized agencies FAO, WHO, UNESCO and ISO—have sought the advice or help of IUPAC on matters of importance to them involving chemistry. This kind of thing is increasing and the Union must consider what, if anything, it proposes to do. In general three types of help are sought which can be roughly exemplified by the following cases:

(1) UNESCO has asked for our help and advice on chemical education for underdeveloped countries. We have made some preliminary efforts to meet this by calling together an *ad hoc* committee.

(2) FAO has asked for advice in connection with problems of standardization—purity determinations on food additives, etc.

(3) ISO wishes to have the advice and the approval of IUPAC in connection with (a) analytical methods and standards and (b) tables of constants, etc.

Even if we have, on paper, the machinery to do these things the plain fact is that at present time we are not able to give the help requested. But, we should realize that such international organizations must get the information they want and that if we do not help, standards and methods will be adopted and brought into general use in chemistry over which we will have no control at all. The result will be that IUPAC will lose all authority and control over international chemical standards.

Now it could be argued that IUPAC could simply refrain from having anything to do with these matters and become merely an organization arranging symposia and looking after atomic weights and nomenclature. But if it is considered that IUPAC should do more than this then some action is called for.

It must be recognized that IUPAC could not itself undertake the whole problem of international standards, etc., unless it were expanded to an enormous and expensive organization with a very large central organization. But it could perhaps meet all reasonable requirements by increasing its central secretariat somewhat and making effective use of the specialized knowledge available through its divisions, sections and commissions. For example it might arrange to act as an information and advice centre for these other organizations by having them address their enquiries to the secretariat which would then transmit them to the appropriate Section President; the latter should then either by himself or by reference to one of his Commissions be able to provide the answer to the problem or alternatively to provide the names of people or organizations who could do so or could be approached to undertake any necessary investigations. This is putting matters only in the most general terms, but provided the work was done promptly and efficiently it might be well within our means financially and would considerably enhance the status of IUPAC and its importance on the international scene.

If it were the opinion of the Bureau that we ought to try to fill the general role indicated one immediate suggestion would be to have the officers of the Divisions of Physical Chemistry, Analytical Chemistry and Applied Chemistry meet as soon as possible to consider the problems and suggest the best mechanism for dealing with them.

The Executive Committee has discussed these matters at some length and feels that a decision on them is urgent; delay will mean that they will pass out of our hands entirely and that unless we do something now it will be too late.

I. PHYSICAL CHEMISTRY DIVISION

REPORT ON THE ACTIVITY

since the Montreal Conference to March 1963

submitted to the President's meeting, London, 25 March 1963

The Division has been active only through its Commissions. The last Section Committee meeting had been held in Montreal.

The Commission Chairmen reported as follows:

I.1 Commission on Symbols, Terminology and Units

Vacancies on the Commission have been filled: GUY WADDINGTON (USA) has been elected chairman and M.L. MCGLASHAN (England) as member. The entire program of the Commission will be reconsidered at London. Close collaboration with ISO TC/12 and the SUN Commission of IUPAP have been established.

I. 2 Commission on Thermodynamics and on Thermochemistry

(1) In 1962 volume II of "Experimental Thermochemistry" (SKINNER) has appeared
(2) Volume I of "Experimental Thermodynamics" (MCCULLOUGH) is under preparation
(3) A volume on Experimental Thermodynamics of Non-reacting Fluids (B. VODAR) is under preparation.
(4) Tables on thermodynamic and transport properties of technical gases will be coordinated by a Secretariat at Imperial College under D.M. NEWITT.
(5) A symposium on Thermochemistry will be held in connection with the London Congress at Lund (Sweden)
(6) The Commission has participated in a symposium of the International Atomic Energy Commission in Vienna in May, 1962
(7) "Task groups" have been formed which will meet in London

I. 3 Commission on Electrochemistry

Our three Sub-Commissions met as CITCE Commissions at Rome, 24 to 29 September.

Sub-Commission 1 (Electrochemical Symbols and Terminology) held round-table discussions on electrochemical kinetics and polarization. These led to the preparation of a report which constitutes Chapter 6 of the general report on "Electrochemical Nomenclature and Definitions". This Chapter 6 has recently been sent for publications in Electrochimica Acta. It may also appear in the Journal of Electroanalytical Chemistry. The latest edition of the first five chapters was published in these two journals in 1961. All these recent reports have been prepared in French, but a complete English version will be prepared in the very near future. By publishing these reports our CITCE and IUPAC groups are submitting their recommendations to the electrochemical profession at large. A great deal of interest has been expressed and as a whole it appears that our recommendations are meeting with rather wide approval. At the London meeting our Commission will decide what to do with these reports from the point of view of their submission to IUPAC as a whole.

Sub-Commission 2 (Electrochemical Thermodynamics) and *Sub-Commission 3* (Electrochemical Kinetics) met chiefly for the presentation of papers. Details about the programmes are available in the CITCE booklet.

I. 4 Commission on Macromolecules

No report available.

I. 5 Commission on Data and Standards

The edition of the minutes of the Second Symposium on Purity Control by Thermal Analysis will be ready for publication in "Pure and Applied Chemistry" at the time of the London Congress. Collaboration with IUPAP is considered and shall be prepared.

I.6 Commission on Molecular Structure and Spectroscopy

(A) A two-days meeting was held in Tokyo, 8 to 9 September, 1962, on the following topics:

(1) Wave length standards for 600 to 10 cm^{-1} will be ready in London
(2) For infrared band intensities recommendations will be ready in London
(3) For NMR recommendations for data representation will be published
(4) Concerning machine documentation the adhering countries will be asked
(5) Recommendations on data representation for rotation dispersion will be ready for London
(6) New members: FOERSTER, PLIVA, VODAR have been elected

(B) The Commission took part in a meeting of the Triple Commission of IUPAC, IUPAP, IAU in Tokyo, on 9 September, 1962.

I. 7 Commission on Colloid and Surface Chemistry

(1) The list of members is complete: President RIDEAL, Secretary ZISMAN; Members: OVERBEEK, HORIUTI, KAMIENSKI, DUBININ, ALEXANDER, DERVICHIAN, GROTH. A reduction by one is planned
(2) Four Sub-Commissions have been formed:
(a) Colloid Systems: OVERBEEK, MYSELS, SCHELDUKOV, STAUFF
(b) Interphase Solid-Gas: DUBININ, HAUL, BRUNAUER, EVERETT, SCHAY, PURI
(c) Liquid Interphases: ALEXANDER, TRAPEZNIKOV, DERVICHIAN, LLOPIS, SEBBA, KAMIENSKI
(d) Heterogeneous Catalysis: HORIUTI, PRETTRE, ELEY, BURWELL

Reports of the sub-commissions are expected in April.

I. 8 Joint Commission of Applied Radioactivity

The Commission has met in Athens on 24 November, 1962. A symposium on "Application of Tracers on Blood Cells" has been postponed. A symposium on "Tracer Application on Permeability of Interphases" will be held together with IUPAB. A symposium on "Isotope Effects" shall be held together with the International Atomic Energy Agency 1963. A symposium on "Application of Isotopes in Pharmacy" has been frustrated. The question on "Application of Radioactive Elements on Human Beings" shall be cleared by questionaries. The question of "Impurities in Marked Compounds by Self-Decomposition" has been treated. As for the "Hönigschmid-Standard" Dr. MORF shall negociate in Paris directly. The next meeting of the Commission will be in Vienna or Athens.

Prof. Dr. G.-M. SCHWAB
President

REPORT ON THE ACTIVITY DURING THE LONDON CONFERENCE

All the meetings of the Division and its Commissions, scheduled in the Program of the Conference, have taken place.

1re Réunion du Comité du samedi 6 juillet 1963, 14 heures

Présents: G.-M. Schwab, *Président;* Sir Harry Melville, Vice-Président; G. Emschwiller, Secrétaire

Membres: R.C. Lord, Sir Eric Rideal, P. van Rysselberghe, K. Schäfer, H.W. Thompson, G. Waddington, E. Wichers.

Membres de Commissions: H. Brusset, N. Ibl, J.A.A. Ketelaar, D.M. Newitt, G. Valensi

Absents excusés: W. Jost, W. Kuhn.

Rapports des Présidents de Commission

I.1 Commission des Symboles, de Terminologie et des Unités

Le Dr Waddington, Président, résume l'œuvre accomplie depuis la précédente conférence.

Le travail de révision des données thermodynamiques se poursuit. Une subvention de 2500 dollars avait été précédemment accordée. Des rapports I_1 et I_2 ont été présentés.

Le problème des abréviations a été étudié en collaboration avec l'ISO.

La Commission recommande l'emploi de l'abréviation *mol* pour le mot *mole*. La question de la définition de la mole est remise à plus tard.

La commission désire que les chimistes soient invités à abandonner progressivement l'emploi comme unités de la calorie, du litre et de l'atmosphère en faveur, respectivement, du joule, du décimètre cube et du bar.

I.2 Commission de Thermodynamique et de Thermochimie

Le Prof. Schäfer, Président, rend compte des travaux nouveaux. Le Bulletin, précédemment édité continue à être fort demandé; de nouveaux fonds seront nécessaires pour la publication du nouveau Bulletin; 1000 dollars avaient été précédemment accordés; il faudra davantage pour 1965; la somme sera précisée lors de la réunion de commission du 8 juillet 1963.

Des livres sont en cours de publication: sur la calorimétrie, la thermodynamique de Lewis, une thermodynamique expérimentale des fluides (avec la collaboration de divers auteurs), un livre de thermodynamique appliquée de Skinner.

Il est envisagé d'éditer des Tables schématiques (Skeleton Tables) sur les propriétés thermodynamiques des gaz. Le Prof. Schwab confirme l'accord à ce sujet du Comité de Division.

Un symposium doit avoir lieu à Lund ce mois-ci.

I.3 Commission d'Electrochimie

Le Prof. van Rysselberghe, Président, résume l'activité de la Commission et celles des Sous-Commissions.

La Sous-Commission 1.3.1 (Symboles et Terminologie électrochimiques) a publié récemment des rapports, avec des recommandations sur les méthodes, les problèmes de nomenclature, etc.; ces rapports sont en langue

française à cause des difficultés auxquelles on se heurte en ce qui concerne les termes relatifs aux tensions, mais un rapport paraîtra bientôt en anglais.

Sous-Commission I.3.2 (Thermodynamique électrochimique). Un atlas de Pourbaix a été récemment publié sur les courbes tension-pH; une édition anglaise sera publiée plus tard par Pergamon. Hamer a présenté des recommandations sur les questions de conventions dans le domaine des potentiels d'électrodes pour les sels fondus.

Sous-Commission I.3.3 (Cinétique électrochimique). Un rapport sera présenté lors de la réunion du 8 juillet 1963 par le Prof. H. Fischer sur l'analyse des données de cinétique électrochimique relatées par des collègues japonais (Tanaka et coll.).

I.4 Commission de Chimie macromoléculaire

Sir Harry Melville, Président, fait connaître que la Commission s'est réunie récemment à Paris, à l'occasion du Symposium de Chimie macromoléculaire. Il remet un rapport relatif à cette réunion (voir plus loin).

Il faut retenir, en particulier, qu'on a fait vérifier les masses macromoléculaires de différents composés dans 40 laboratoires du monde.

Le Dr Thompson fait remarquer que le rapport pourrait avantageusement être soumis pour publication dans le Journal de l'IUPAC.

Des arrangements sont pris avec le National Bureau of Standards pour la conservation d'échantillons de référence de poids moléculaire certifié. Diverses compagnies procéderaient à la préparation de ces échantillons, qui seraient vendus 15 dollars chacun. Il y aurait aussi des dépôts à l'Ecole polytechnique de Brooklyn.

On commence à accumuler des données sur la réactivité des hauts-polymères; un livre est en cours de publication.

Du point de vue nomenclature, on se préoccupe de caractériser les différents polymères stéréospécifiques. Un rapport à ce sujet serait également à soumettre pour publication dans le Journal de l'IUPAC.

Des négociations sont en cours sur la publication de ces rapports dans différentes langues.

Une réunion est prévue pour 1965 en Tchécoslovaquie, à condition que le Comité russe d'organisation du Congrès de Moscou soit d'accord.

I.5 Commission des Données et Etalons physico-chimiques

Le Dr Wichers, Président, signale que sa commission s'occupe des valeurs à recommander pour les constantes fondamentales et de leur cohérence.

Il annonce que l'U.S. National Academy of Sciences et le National Research Council Committee on Fundamental Constants ont mis au point une liste des valeurs des constantes fondamentales.

Un rapport sera présenté à Vienne sur les masses des nucléides.

Il propose que soit demandé à l'IUPAP d'accepter un délégué de l'IUPAC dans sa Commission des Constantes.

I.6 Commission de Structure moléculaire et de Spectroscopie

Le Prof. Lord, Président, rend compte d'une réunion de sa Commission tenue à Tokyo; une autre a eu lieu depuis à Columbus.

Des tables sont dressées pour les spectres dans l'infrarouge lointain. On va préparer aussi des tables pour l'ultraviolet.

La Commission s'est occupée également de symboles, d'unités, de terminologie.

Bien qu'elle ne comprenne pas de spécialiste de résonance magnétique nucléaire, elle a préparé une série de recommandations sur la façon de présenter les données de RMN. Des objections ont été présentées sur ces recommandations par des groupes industriels; il en sera discuté lors de la réunion du 8 juillet 1963.

Une brève allusion est faite à une sous-commission destinée à s'occuper plus spécialement d'ultraviolet et de fluorescence.

I.7 Commission de Chimie des Colloïdes et des Surfaces

Sir Eric Rideal, Président, remet un premier rapport de sa Commission. Des précisions y sont données sur la composition de cette Commission, comme aussi sur celles des 4 sous-commissions récemment créées.

Il fait mention d'une collaboration recherchée avec le prochain Congrès de Catalyse, puis discute de certains points relatifs à l'organisation de sa Commission.

Il met au courant de ses rapports avec le CID (Congrès de la Détergence).

Le *National Research Council* des USA envisage de publier des données sur les états de surfaces et les colloïdes; le Dr La Mer s'occupe de rapports à ce sujet. Il est discuté de la liaison avec l'IUPAC, comme des contacts à établir.

Il est procédé là-dessus à un échange de vues, auquel prennent part, en particulier, les Drs Thompson et Waddington: problème des publications par des groupes extérieurs, utilité du patronage de l'IUPAC.

Le Prof. Schwab insiste sur la nécessité d'agir en accord avec la Commission de Terminologie.

Nombre des membres des commissions

D'après les nouveaux statuts, maintenant ratifiés par le Conseil, le nombre maximal de membres des commissions est fixé à 8 titulaires et à 4 associés; le nombre des membres des sous-commissions ne peut dépasser 4.

Ces décisions font l'objet de critiques et une importante discussion s'engage à ce sujet.

Le Dr Wichers propose que soit considéré de nouveau en détail le problème de la composition des commissions et des sous-commissions, car les nouveaux statuts obligent à réduire le nombre actuel des membres associés des commissions et des membres des sous-commissions.

Il est décidé de proposer la constitution d'un Comité de 6 membres pour discuter ce problème de la composition des commissions.

Election de nouveaux membres des commissions et du Comité de Division

Le secrétaire énumère les membres des commissions dont le mandat arrive cette année à expiration; ils sont éventuellement rééligibles, car, d'après les nouveaux statuts, la durée du mandat, fixée en principe à 4 ans, est susceptible d'être portée à 8 ans.

On examine successivement comment se présente la situation dans chaque commission. La question est posée de savoir si un membre de commission peut y demeurer plus de 8 ans, s'il vient à occuper un office ou à changer d'office. Des décisions seront prises lors des séances de commission du 8 juillet et communiquées au Comité lors de la séance du 9 juillet.

En ce qui concerne le Comité de Division, le Prof. JOST, les Drs THOMPSON et WICHERS, qui sont en fonction depuis 1959, ne peuvent être renouvelés, mais cela ne fait que deux places disponibles, car le Comité comportait 11 membres au lieu de 10.

Le Dr WADDINGTON, qui a succédé au Prof. JOST à la présidence de la Commission I.1, est proposé pour lui succéder au Comité. Le Dr WICHERS pourrait, de même, être remplacé par son successeur éventuel à la présidence de la Commission I.5

Proposition de la Commission de Thermodynamique et de Thermochimie

Le Prof. SCHÄFER reprend sa proposition de publication de Tables schématiques (Skeleton Tables) sur les propriétés thermodynamiques des gaz. Cette publication pourrait être faite avec le patronage de l'IUPAC. Le financement pourrait être assuré par la *National Foundation of Sciences* des USA.

Le Prof. SCHWAB confirme l'accord du Comité de Division.

Collaboration avec l'UNO, ISO, etc.

Le Président SCHWAB présente un exposé sur ce sujet et conclut que l'IUPAC est prête à collaborer avec ces organismes.

Règlement de la Division

Chaque division est appelée à préparer un règlement afin de fixer les droits et devoirs du Président, comme aussi les droits et devoirs des présidents de commission et tous autres points éventuels.

Le Prof. SCHWAB remet le texte d'un rapport rédigé à ce sujet par la Division de Chimie analytique. Il est décidé que le Secrétaire du Comité procédera à l'examen de ce document et que des décisions seront prises ultérieurement.

Enseignement de la Chimie

Le Président SCHWAB présente un exposé sur cette question. Il rappelle qu'il s'agit là d'une enquête de l'UNESCO essentiellement destinée à préciser les méthodes d'enseignement à recommander aux pays sous-développés. Une commission a été désignée à cet effet pour la chimie; elle est présidée par le Prof. BÉNARD.

Le problème se pose aussi d'une certaine unification des méthodes d'enseignement destinée à faciliter les échanges d'étudiants.

Des problèmes pourront se poser pour l'enseignement de la chimie physique.

Symposium pour 1964

Le Président précise que, si les Commissions envisagent l'organisation de symposiums, elles sont susceptibles de bénéficier de l'appui financier de l'IUPAC; elles doivent d'urgence faire connaître leurs intentions à ce sujet.

Questions diverses

Des précisions sont demandées par le Prof. VALENSI quant à l'éventualité de la suppression d'organismes affiliés, tels que le CITCE. Le Prof. SCHWAB lui donne des apaisements à ce sujet.

Prof. G. EMSCHWILLER
Secrétaire

2e Réunion du Comité du mardi 9 juillet 1963

Présents: G.-M. Schwab, Président; G. Emschwiller, Secrétaire;

Membres: R.C. Lord, Sir Eric Rideal, P. van Rysselberghe, K. Schäfer, H.W. Thompson, G. Waddington

Membres de Commissions: N. Ibl, G. Valensi

Elections

Des précisions sont fournies en ce qui concerne le renouvellement des commissions. Les changements signalés sont les suivants. Dans la Commission I.2 le Dr A.J. Ede succède au Prof. Newitt. Dans la Commission I.5, le Dr L.A.K. Staveley succède comme président au Dr E. Wichers. Le Dr W.M. Smit demeure secrétaire. La Commission comprend en plus les membres suivants: H. Kienitz, Th. Plebansky, Ch. Proffer Saylor, A.L.G. Rees, D. Herrington, D. Stull. La Commission comprend aussi six membres délégués (R.P. Graham, M. Milone, J.N. Mukhergee, W. Swietoslawski, J. Terrien, H. Moser) et trois membres associés (J.P. Wibaut, Y. Mashiko, S. Sunner).

Pour les Commissions I.3 et I.7, voir plus loin.

Conformément aux décisions prises lors de la réunion du Comité du 6 juillet, le Dr L.A.K. Staveley est élu membre du Comité de la Division, en remplacement du Dr E. Wichers, auquel il succède à la présidence de la Commission I.5.

Reports of the Commission Chairmen

The Commission recommends the introduction of the abbreviation "mol" and the abolition of the units: "cal, l, atm". See Report of Commission I.1. The Commission has decided to change its name into: Commission of Symbols, Terminology and Units".

The Commission of Thermochemistry and Thermodynamics wants $1000.– for 1964 and 1965 each for the edition of the Bulletin. In summer 1965 this Commission will meet together with IAEA in Vienna. Furthermore the Commission wants to send two representatives to IUPAP for a meeting concerning Nuclidic masses. For this $300.– are needed. See Report of Commission I.2.

The Commission of Electrochemistry presents a final report: See Report of Commission I.3

The Commission of Macromolecules was not represented: See Report of Commission I.4.

The Commission of Data and Standards proposes to redefine the liter as being the volume of 1 dm^3.

The Commission of Spectroscopy has founded a new Sub-Commission on the storage of Data, headed by H.W. Thompson. The Commission wants to send a representative to the meeting of the Triple Commission in Hamburg. For this $500.– are needed. The next meeting is planned for 1965 in Paris, and an informal meeting will take place in USA in 1964.

The Commission on Colloid and Surface Chemistry will have its first meeting in 1964: See Report of Commission I.7.

Recommendations

The Division recommends to propose to the International Commission of measures and weights that the liter may be defined as the volume of 1 dm^3. The use of cal and atm shall slowly be abolished. The mole will be introduced by the abbreviation "mol"; however, its exact definition has not yet been established.

Further, the division recommends to form a Commission of IUPAC which will deal with the question of the number of members of Commissions and Sub-Commissions and especially the number of associate members.

I.1 Commission on Symbols, Terminology and Units

Meetings of the Commission were held on July 4 and 5, 1963. Present were:

Titular Members: G. WADDINGTON (USA), President; H. BRUSSET (France) Secretary; F. DANIELS (USA), M. MILONE (Italy), M.L. MCGLASHAN (England), K.J. PEDERSEN (Denmark), E.H. WIEBENGA (Netherlands).

J.I. GERASSIMOV (USSR) was unavoidably absent.

Observer: W. JAENICKE (Germany).

G. WADDINGTON and K.J. PEDERSEN reported on their attendance at the Sixth Plenary Session of ISO/TC 12 in Copenhagen, June, 1963, and H. BRUSSET on his attendance at meetings of the S.U.N. Commission of IUPAP in September 1961 and December 1962.

It was decided that the IUPAC Manual of Physico-Chemical Symbols and Terminology will be revised. Preliminary study of the problems will begin immediately and a special meeting to speed up the work will be held in Copenhagen in July 1964. An effort will be made to achieve as much consistency as possible with corresponding manuals issued by ISO/TC 12 and IUPAP.

ISO/TC 12 draft document "Quantities and Units of Physical Chemistry and Molecular Physics" was reviewed carefully. Many observations, major and minor, were subsequently transmitted to the TC 12 Secretariat. Of special interest is the proposal of ISO/TC 12 to use the term *relative atomic mass* in place of *atomic weight*.

H. BRUSSET reported on a preliminary study of the need for a list of physicochemical symbols for chemical engineers. Further advice on this problem will be sought from appropriate chemical engineering bodies.

A USSR proposal for a new definition of reaction rate, already approved in principle, was improved further for publication, after review, in the next revision of the manual.

The Commission recognized the mole as a basic unit for expressing quantity of substance and recommends that the abbreviation mol be used for the word mole. Endorsement of the foregoing will be sought from the IUPAC Council, with other related matters, when the Manual is revised.

The Commission recommends that chemists be urged to abandon progressively the use of the units calorie, liter and atmosphere in favor of the units joule, cubic decimeter and bar. The Commission concurred in a resolution of the Committee on Physico-chemical Data and Standards that IUPAC urge CIPM to redefine the liter as equal to one cubic decimeter.

Dr. R.G. BATES (USA) and Dr. W. JAENICKE (W. Germany) were elected Titular Members and Prof. SYÛZÔ SEKI (Japan) was elected Associate Member. Sincerest thanks were given to Prof. DANIELS for his valuable services to the Commission.

GUY WADDINGTON, Chairman

I.2 Commission on Thermodynamics and Thermochemistry

Meetings were held on 6–8 July, 1963. The attendance was:

Titular Members: K. SCHÄFER, President (Germany), GUY WADDINGTON, Secretary (USA), H.A. SKINNER, Editor (England), C.W. BECKETT (USA), J.I. GERASSIMOV (USSR), D.M. NEWITT (England), S. SUNNER (Sweden), B. VODAR (France).

Associate Members: E. Calvet (France), M. Colomina (Spain), J.D. Cox (England), L. Deffet (Belgium), E.U. Franck (Germany), R. Hara (Austria), E.F.G. Herington (England), W.N. Hubbard (USA), E.J. Prosen (USA), F.D. Rossini (USA), R.F. Strickland-Constable (England), Edgar F. Westrum, Jr. (USA), F.E. Wittig (Germany), B.J. Zwolinski (USA).

Observer: W.D. Good (USA).

General Sessions were held 9 to 12 o'clock, 6–8 July; an Executive Session (Titular Members only) 12.15 to 13.15 h, 8 July, and informal meetings of the following Task Groups (a) Bulletin on Thermodynamics and Thermochemistry, (b) Reference and Calibration Standards, (c) Temperature Scales, (d) Fundamental Constants, (f) Vol. II. Experimental Thermodynamics of Non-reacting Fluids, (f) Symposia and (g) Thermodynamic Tables. The main work of the Commission is now carried on by a number of Task Groups. Brief reports follow of matters discussed and decisions made at these meetings.

President Schäfer referred to the successful symposium, sponsored jointly with the U.S. Calorimetry Conference at Ottawa, Canada on 14–17 August 1961, and to participation by Commission members in a conference on "Thermodynamics of Nuclear Materials", sponsored by the International Atomic Energy Agency at Vienna, Austria, May 1962. He also reported that Vol. II, Experimental Thermochemistry, Editor, H.A. Skinner, had been published.

Task Group on Bulletin of Thermodynamics and Thermochemistry (Chairman, H.A. Skinner) The 1962 Bulletin (200 pp.) was produced at 900, and 1963 (250 pp.) at 1000 copies and circulated gratis to the same extent in 26 countries. Distribution of the Bulletin is controlled but demand gives signs of rising sharply. In future, solicitation of abstracts and their editing and indexing will be done by Edgar F. Westrum, Jr., of the University of Michigan. Distribution will continue through Guy Waddington, U.S. National Research Council, Washington, D.C. The bibliography and indexing of recent papers will continue to be prepared at the National Bureau of Standards (Wm. Evans and D.D. Wagman) and Texas A & M University (B.J. Zwolinski).

Task Group on Skeleton Tables of Thermodynamic Properties (Chairman, D.M. Newitt). A plan to establish an International Secretariat for coordinating preparation of skeleton tables of thermodynamic properties has been developed. A detailed proposal, approved by the Bureau of IUPAC, has been prepared by the Commission, and will be used to seek supporting funds from appropriate bodies in several countries. When funding arrangements are complete the program will be started.

Task Group on Reference Materials (Chairman C.W. Beckett). The status of reference materials and calibration techniques used in calorimetry and other thermodynamic measurements was reviewed. After revisions to conform with changes in the temperature scale in 1966, specific heat standards (benzoic acid, *n*-heptane, and synthetic sapphire) can be adopted as international standards. Additional research on other solids (such as thoria and tungsten) is needed to obtain standards for temperatures above 2000 °K. Acid-base reactions are being considered for calibration of heat of solution calorimeters. Possible suitable pairs are H_2SO_4-NaOH and HCl-THAM (tris hydroxymethyl amino-ethane). Various pairs of liquids were suggested for non-aqueous heat of mixing standards. Steps are being taken to start a co-operative test program on the relative merits of the alternative proposals for both aqueous and non-aqueous systems. The need for a long range program

to develop a series of pressure standards was pointed out. High pressure standards and calibrating techniques are being investigated by a number of groups throughout the world.

Task Group on Temperature Scales (Chairman G.W. BECKETT). The current status of the International Practical Temperature Scale and proposals for its revision in 1966 by the Advisory Committee on Thermometry of the International Commission on Weights and Measures (CIPM) was discussed. There was agreement on the following points: (1) It was agreed that an extension of the platinum scale upward to the gold point and downward to the hydrogen point is urgently needed. (2) It was agreed that a critical evaluation of differences between the IPTS and thermodynamic scale is also needed. The views of the Commission will be conveyed to the Advisory Committee for Thermometry of CIPM.

Task Group on Fundamental Constants (F.D. ROSSINI). The need was stressed for an internationally agreed set of the basic fundamental constants to add precision to the communication among scientists of the results of quantitative observations. A review and analysis was presented of a recent reevaluation of the basic constants carried out within the Committee on Fundamental Constants of the U.S. National Academy of Sciences. Subsequently, in order to encourage adoption of the new value, the views of the Commission were conveyed to the Commission on Nuclidic Masses and Related Constants of IUPAP by F.D. ROSSINI at a July 15, 1963 meeting of that body in Vienna.

Task Group on Volume I, Experimental Thermodynamics, Calorimetry of Non-reacting Systems (Chairman J.P. MCCULLOUGH, by H.A. SKINNER) It was reported that of the 18 chapters of Volume 1, 5 chapters are complete, 7 are well advanced, and the other 5 have been started. D.W. SCOTT of the Bureau of Mines, Bartlesville, Oklahoma, has been appointed co-editor to assist J.P. MCCULLOUGH.

Task Group on Volume II, Experimental Thermodynamics of Non-reacting Fluids (Chairman, B. VODAR). This volume will comprise a description of the following subjects: measurements of fundamental parameters (pressure and temperature) over the entirety of the accessible range; thermodynamic properties of pure fluids; phase equilibria (including melting); surface properties, and thermodynamic data from electrochemical potentials (transient phenomena, which lead to the highest temperatures and pressures, will also be included). The book will be composed of about 28 chapters, a tentative list of which was presented. Detailed planning and selection of authors is underway.

Task Group on Symposia (Chairman S. SUNNER). It was reported that about 170 would attend the July 18–23, 1963 Symposium on Thermodynamics and Thermochemistry in Lund, Sweden. Topics announced for the general sessions were: Calorimetry of combustions and related reactions; calorimetry of reactions other than combustion; calorimetry of non-reacting systems with particular emphasis on solution and mixing processes; coordination enthalpies; biochemical calorimetry; ordering transitions and phase transition calorimetry. The possibility is being investigated of a symposium in Vienna, Austria, in 1965 to be jointly sponsored by the Commission on Thermodynamics and Thermochemistry and the International Atomic Energy Agency.

Special reports included (a) a short presentation by W.D. GOOD of the U.S. Bureau of Mines on a new value of ΔH_f° for H_3BO_3 and (b) new data by J.D. Cox, of the National Chemical Laboratory (England), for the heat of

combustion of *p*-fluorobenzoic acid which has been proposed as a thermochemical reference standard for organofluorine compounds. M. COLOMINA of the Instituto de Química Física, Madrid, reported on thermochemical studies on benzoic acid derivatives. Prof. CALVET of the Institute of Microcalorimetry and Thermogenesis of Marseille called attention to the need for a better temperature scale in the high temperature region and for identification of melting points of suitable additional substances as fixed points.

On request the Secretary explained the current status of recommended symbols and terms for the Gibbs and Helmholtz Energies. The official IUPAC position on these symbols and terms is as stated in Minute 25 of the Aug. 2–5, 1961 Council Meetings in Montreal, Comptes Rendus de la Vingt et Unième Conférence, page 122. The main point of the recommendation is that to minimize confusion it is important to eliminate use of F as a symbol, and "free energy" as a term, for *both* quantities.

After discussion the Commission endorsed a recommendation of the Commission on Physicochemical Symbols and Terminology that: "Chemists be urged to abandon progressively the use of the units calorie, liter and atmosphere in favor of the units joule, cubic decimeter and bar».

GUY WADDINGTON, Secretary

I.3 Commission on Electrochemistry

Composition of the Commission for period 1963–65:

Titular Members: list unchanged; all terms expire in 1965. The officers remain the same: VAN RYSSELBERGHE, President; VALENSI, Vice-President; IBL, Secretary.

Members: BATES, DEFAY, FISCHER, FRUMKIN, HAMER. All were present at London except FRUMKIN.

Associate Members: a revised list is being submitted.

The three half-day sessions in London were devoted to review and discussion of the work of the three sub-commissions:

I.3.1 Electrochemical Symbols and Terminology. Remarks on reports in press, presentation of an abbreviated report, discussion of Chapter on electrode kinetics.

I.3.2 Electrochemical Thermodynamics. Presentation by Dr. HAMER of a report and of a compilation of electrochemical equilibrium data pertaining to fused salts and proposals for conventions regarding electric tensions of electrodes in fused salts.

I.3.3 Electrochemical Kinetics. Presentation by Prof. FISCHER of plans for systematic compilation of data on electrode kinetics, tabulation of corresponding parameters (transfer coefficients, exchange currents, etc.). Discussion of a preliminary report on such data by Dr. TANAKA (present at the meeting) and TAMAMUSHI, publication being recommended.

Dr. N. IBL
Secretary

I.4 Commission on Macromolecules

Meetings of the Commission were held at Paris on July 1–3, 1963.

Present:

Titular Members: Sir HARRY MELVILLE, (England), *Chairman*; V. A. KARGIN (USSR); W. KERN (Germany); M. MAGAT (France); I. SAKURADA (Japan); O. WICHTERLE (Czechoslovakia).

National Representatives: H. Benoit (France); V. Desreux (Belgique); F. Danusso (Italy); F.R. Eirich (USA); G.M. Guzman (Spain); S. Okamura (Japan); G. Smets (Belgique); E. Turska (Poland); K. Vesely (Czechoslovakia).

Attending: S.H. Atlas (USA); R. Boyer (USA), J.W. Breitenbach (Austria); H. Hellfritz (Germany) R. Morf (Switzerland);N.S. Nametkin (USSR).

Associate Members: A.J. Staverman (Netherlands); H.L. Williams (Canada).

Invited by the General Secretary: M. Letort (France).

(1) The proceedings of the Montreal 1961 meeting are adopted.

(2) The report of the Sub-Commission Huggins on the nomenclature of stereo-regular polymers that was already discussed and tentatively approved in Montreal receives final approval.

It is already translated into several languages and published in the near future in national Journals. Many countries have waited for the final approval before publishing.

Should some modifications become necessary, they will be discussed on the following meetings.

(3) Dr. Atlas presents the final report concerning measurements made in different laboratories on the three standard samples S. 102, S. 111 and S. 114. The agreement between different authors seems good for the relatively low molecular weights samples S. 101 and S. 111. The agreement is much less satisfactory for the very high molecular weight samples S. 114.

The chairman suggests that Prof. Mark and Dr. Atlas be thanked and congratulated on the work they did in distributing the samples and correlating the results. We thank Dr. McCormick (Dow Chemical Co.) for preparing these samples.

The final report will be published in the "Journal of Polymer Science".

The remaining amounts of S. 101 and S. 111 will be kept by the National Bureau of Standards and given to all laboratories who may request it for calibration purposes.

The existence of these possibilities will be advertised.

Concerning the samples S. 114, it was decided that an attempt will be made by Dr. Atlas to obtain from different laboratories which investigated those samples detailed information about the difficulties met and about the way the sample was stocked before measurements as well as the exact dates at which the measurements were performed. It appears indeed that this particular sample degrades with time (colorshift). Dr. Atlas will attempt to establish a correlation between these informations and the data obtained by different laboratories. The question will be taken up on the next Commission meeting where the eventuality of a new re-investigation of a very high molecular weight sample will be considered.

(4) Dr. Eirich announces that a certain number of standard unfractioned polymers and copolymers, prepared under known conditions and whose essential properties in solution and in bulk were determined by at least one laboratory, will be available at Eastman Kodak for a price of about $15 per sample.

Each laboratory which acquires such a sample is requested to provide the distributor with all results obtained. These results will be communicated to all future and past buyers. The samples are to be kept in cold store and in the dark.

Indices of the materials and their properties would also be held at NBS and the Polymer Institute, Brooklyn, who as time permits would carry out

research on the samples and add their data. Their indexes would be available on request to ASTM and the Commission on Macromolecules of IUPAC.

Here is a temporary list of the samples:

Polyethylene	molecular weight, N average
Polypropylene	molecular weight, M average
Polystyrene—atactic + isotactic	melting point
Polyvinylchloride	softening point
Polyvinylacetate	glass transition point
Polymethylmethacrylate	density
Polyacrylonitrile	intrinsic viscosity number (2 solvents)
Polyvinylidenechloride Teflon	second virial coefficient (2 solvents)
Polyisobutylene	melt.
1,4 cis-isoprene	end groups
1,4 cis-polybutadiene	unsaturation
1,4 trans-polybutadiene	impurities
1,2 polybutadiene	degree of branching
Polystyrene butadiene rubber	degree of tacticity, % crystallinity
Butadiene acrylonitrile rubber	mechanical master curve
Nylon 6	flame point
Nylon 6–6	sample history
Urethane	
Polyethyleneterephthalate	dielectric constant
Polybisphenolcarbonate	water content
α-cellulose	

The Commission accepts to sponsor this activity.

(5) It was suggested that the Commission may undertake a compilation of data concerning the reactivity ratios for the formation of co-polymers. However, it was learned in the meantime that a book (by G. Ham: "Copolymerization", Interscience Publishers, Inc.) is in preparation on copolymers comprizing a compilation of all existing data. It was decided that galley-proofs of the corresponding pages will be distributed by Prof. Mark to the members of the Commission sufficiently early before the next Commission meeting so as to allow them to judge if the compilation is satisfactory or if a new compilation ought to be made or if the Commission should induce some laboratories to re-determine some of the ratios in the case the existing data would appear unsatisfactory.

(6) The question was raised if the Commission ought to initiate a program concerning quantitative determination of stereospecificity of different polymers. For the time being, the most promising way to do this seems to be the determination of NMR spectra. But this work is only on its beginning. It was suggested that laboratories which will acquire samples mentioned by Dr. Eirich will do if possible their NMR spectra. The spectra will be collected and compared in order to determine the reproducibility. Eventually, a program of the type of that of polystyrene samples may be initiated at the next meeting. The same situation arises concerning the characterization of graft and block copolymers. It is hoped that in 2 years time, some experiments under way on this question will be sufficiently advanced so as to make the consideration of this problem possible. (After the meeting, Prof. Desreux suggested that the members of the Commission might examine for percentage crystallinity samples of polypropylene and iso-tactic poylystrene from Eastman-Kodak. These measurements would be reported to the Commission at its next meeting.)

(7) Dr. H. Hellfritz exposes to the Commission the problems connected with the project of establishment of product patents in Europe. The intro-

duction of product patents implies the possibility to characterize exactly the polymers so far as their structure and properties are concerned.

An internation group of experts on which two of the members of the Commission (Prof. Benoit and Prof. Kern) participate will investigate different possibilities of such characterization.

It was decided that the Commission will be kept informed by Prof. Kern and Prof. Benoit of the work of the group of experts and may if necessary act in advisory capacity, but does not intend to initiate any research work on this point.

(8) Concerning the future meetings, the formal Indian proposal to have the next Symposium in India in 1965 is cancelled.

An invitation to have a meeting in October 1966 in Japan is presented by Prof. Sakurada and accepted.

However it seems necessary to have a meeting in 1965. After considering the Hungarian position and in view of the difficulties of organizing a joint meeting between Hungary and Czechoslovakia, the organization of the 1965 meeting is intrusted to Czech Colleagues Prof. Wichterle and Vesely. It will take place in Prague in June or July 1965 and will be organized in a very different way from usual procedure.

Several symposia on precise questions, each of which is supposed to interest a limited number of people, will be run simultaneously. No complete text will be requested and no formal publication will be made, but an abstract will be submitted for presentation and discussion by relatively small groups of specialists. Such an organization of a conference seemed to the Commission to be worth trying. It implies however that financial support will be given by Governemental and Scientific Institutions to their affiliates who want to attend such a meeting, without them being obliged to present a paper. This point will be raised by Sir Harry Melville at the London IUPAC Conference in order to obtain the support of the IUPAC organization as such.

It is decided that the agreement of IUPAC be requested concerning the date and place of next Symposium. Since the next IUPAC Congress will be held in Moscow in 1965, Sir Harry Melville will seek the agreement of the IUPAC for the project to have the Macromolecular Symposium in Prague.

(9) Several members of the Commission are retiring: Prof. Kargin, Prof. Kern and Prof. Sakurada. Prof. Kargin announces that the name of his successor will be proposed by the Soviet Academy of Science in the near future and that he himself will become national representative. Prof. Sakurada will be replaced by Prof. Okamura, Prof. Schulz replacing Prof. Kern.

The death of Prof. Nasini raises the question of his replacement. It is decided that Prof. Danusso will act as member of the Commission on place of Prof. Nasini till the moment when this last should have normally retired.

It was further decided to request Hungary and Israel and eventually Denmark to designate national representatives to the Commission. The name of Prof. Hardy for Hungary and Prof. Katchalsky for Israel were suggested.

It was decided that on the next meeting, when several members of the Commission will retire, the question of permanent representatives of the large countries will be re-examined.

Finally, Sir Harry Melville was required by the Commission to insist at the IUPAC Conference on the necessity to continue the Commission on Macromolecules and to ask other international organizations (International Union of Physics, Biology, etc.) to send representatives to the next Commission meetings.

Sir Harry Melville
Chairman

IUPAC **Various suggestions regarding subjects for future Congresses**—This is only a draft proposal without any liability (For Information and Comments) as on 30 January 1964

YEAR	CONFERENCES	PHYSICAL CHEMISTRY	INORGANIC CHEMISTRY	ORGANIC CHEMISTRY	BIOLOGICAL CHEMISTRY	ANALYTICAL CHEMISTRY	CHEMICAL TECHNOLOGY	APPLIED CHEMISTRY I	II	III	IV	V	VI	VII	VIII	IX	COORDINATION CHEMISTRY	SPECTROSCOPY	CATALYSIS	SOLID STATE
1951	XVI New York Washington	New York Washington	New York Washington	New York Washington	New York Washington	New York Washington	New York Washington	N.Y. Wash.	N.Y. Wash.	N.Y. Wash.	N.Y. Wash.	N.Y. Wash.	N.Y. Wash.	N.Y. Wash.	N.Y. Wash.	N.Y. Wash.				
1952																				
1953	XVII Stockholm	Stockholm														Wood Symposium Uppsala				
1954			Münster																	
1955	XVIII Zurich	Macromol. Symposium Zurich		Zurich																
1956						Analytical Congress Lisbon														
1957	IXX Paris	Paris	Paris	Paris																
1958																	Symposium London			
1959	XX Munich		Munich		2 Symposia Munich					3 Symposia		Ultrahigh Pressure Removal of Biological and Industrial Waste Food Additives						Bologna		
1960		Macromol. Moscow		Symposium Natural Products Australia	Symposia Edinburgh														Paris	Amsterdam
1961	XXI Montreal	Montreal		Symposium Theoretical Chemistry		Symposium Penna. USA Budapest				Symposia on		Wood Plastics Electrochemistry					Symposium USA			
1962				Natural Products Prague/Florence Brussels													Sweden	Symposium Tokyo		
1963	XXII London	Macromol. Paris–Lund	Symposium High Temperatures USA	London		Partly London				5 Symposia in London								Symposium Budapest		
1964		Photochem. Strasbourg Rhode Island	see Coord. Chemistry	Kyoto Heidelberg			Symposium USA Medical Chemistry ?										Vienna		Amsterdam	Munich
1965	XXIII Paris *	Moscow	Moscow		Moscow	Moscow Symposium USA	Moscow			Symposia in Latin America								Copenhagen		
1966		El. Chemistry South Africa	see Coord. Chemistry							Symposia in South Africa							Zurich A. Werner			
1967		Western or USA	Europe USA	or USA	Western Europe USA	USA				Symposia in Latin America							? ? ?			
1968										Symposia in Latin America and Symposia in Middle East							? ? ?			
1969		USA	USA	USA	USA	USA	USA			Symposia in Europe and South Africa										
1970		Australia		Australia						Symposia in USA										
1971		Western	Europe	Western	Europe					Symposia in Asia										

* provided an official invitation is received

I.6 Commission on Molecular Structure and Spectroscopy

Sessions were held in London on July 6 and 8, 1963. The following were present:

Titular Members: R.C. LORD, President (USA), R.N. JONES, Secretary (Canada), J. LECOMTE (France), S. MIZUSHIMA (Japan), H.W. THOMPSON (England).

Associates: TH. FÖRSTER (Germany), V.N. KONDRATIEV (USSR), J.A.A. KETELAAR (Netherlands), J. PLÍVA (Czechoslovakia), E.K. PLYLER (USA), B. VODAR (France), M.K. WILSON (USA).

Advisory Counsellor: G. HERZBERG (Canada).

National Representative: T. URBANKSI (Poland).

By invitation: H. MORGAN (USA), A.R. PHILPOTTS (England), A. SAVITZKY (USA).

(1) Problems associated with symbolism for infrared band intensities and wavenumber positions were discussed, and it was agreed that the recommendations of the Commission should now be summarized and submitted for publication in Pure and Applied Chemistry. Recommendations for the recording of nuclear magnetic resonance spectra were agreed upon, and a report on this subject will also be prepared for publication. Progress was made in the standardization of the nomenclature and the representation of optical rotatory dispersion curves; final agreement on this problem should be achieved soon.

(2) HERZBERG submitted a revised version of the "Dictionary of Spectroscopic Terms in English, French, German, Japanese and Russian", incorporating modifications suggested at the Tokyo Meeting of the Commission in 1962. This version has been approved recently by the Triple Commission for Spectroscopy. It was agreed that arrangements should be made for its publication in the near future.

(3) The Commission has been asked to advise on the standardization of methods for reporting fluorescence emission spectra. The technical aspects of a report submitted by an *ad hoc* Committee under the chairmanship of Dr. C.A. PARKER were discussed. It was agreed that the Commission should go on record as supporting the objectives of these proposals, though it did not necessarily endorse all the recommendations of the *ad hoc* Committee.

(4) The use of computers and other electronic devices for the documentation and storage of spectral data was reviewed by Dr. SAVITZKY. Progress in this field is rapid, and the data is accumulating at such a pace that mechanical storage and retrieval techniques are no longer adequate. A new Sub-Commission on the Storage and Retrieval of Spectroscopic Data was established. This Sub-Commission will take note of the developments in this field and it will be prepared to recommend specifications governing the quality of spectral data suitable for codification in such collections.

(5) The problem of infrared intensity standards was discussed. Technical difficulties in the design of infrared spectrophotometers continue to hamper progress in this field. Developments in the use and construction of mechanical photometer systems, and of precision absorption cells, were described. The use of continuous gas lasers as emission sources of quasi-monochromatic infrared radiation was reported by Dr. MORGAN. These sources could prove extremely valuable for the experimental measurement of the spectral slit function, and so permit better evaluation of the instrumental factors distorting band shape and band intensity. Considerably more research must be carried out before infrared intensity standards adequate to meet the needs of chemists using grating spectrometers can be formulated.

(6) Data permitting the extension of the Commission's "Tables of Wave-numbers for the Calibration of Infrared Spectrometers" to the range 600–10 cm^{-1} are now available. It was recommended that work on the preparation of supplementary tables for the far infrared region should now proceed.

(7) Work on photometric precision in the medium ultraviolet carried out recently by the Ultraviolet Spectroscopy Group in Britain was reported by Dr. PHILPOTTS, and he agreed to keep the Commission informed of further progress with these measurements.

(8) It was suggested at the Tokyo meeting that it would be useful to document the characteristics of spectrometers manufactured in various countries, and arrangements were made to collect this material.

(9) Relations with the Triple Commission for Spectroscopy were discussed, and the President reported on the recent meeting of that body at Columbus, Ohio on June 13, 1963.

(10) It is planned to hold the next meeting of the Commission in Europe in 1965, preferably at a time and place convenient with respect to the VIIIth European Congress on Molecular Spectroscopy which will take place at Copenhagen in August.

Prof. R C. LORD
Chairman

I.7 Commission on Colloid and Surface Chemistry

The formation of a Commission on Colloid and Surface Chemistry was authorised by the Bureau and Council of IUPAC at Montreal (Canada), in August, 1961. During the first year the Commission was constituted as follows:

Chairman: Sir ERIC RIDEAL (England)

Secretary: Dr. W.A. ZISMAN (USA)

Members: Prof. J.TH.G. OVERBEEK (Netherlands), Prof. J. HORIUTI (Japan), Prof. B. KAMIENSKI (Poland), Academician M.M. DUBININ (USSR), Prof. A.E. ALEXANDER (Australia), Dr. D.G. DERVICHIAN (France), Dr. K. GROTH (Sweden)

During this year a new laboratory for research on fundamental and applied surface chemistry has been inaugurated in Sweden under the direction of Prof. PER EKEVALL of Åbo and Dr. GROTH as General Secretary. This has compelled Dr. GROTH to resign from the Commission.

The terms of reference laid down for this Commission were as follows:

(1) Symbols and terminology in basic research, e.g. the symbols for energy, free energy, entropy per unit of surface, for heat of adsorption at constant volume, at constant pressure, at constant surface coverage, for surface pressure, surface viscosity.

(2) Definitions, e.g. the size and sign of phase boundary potentials, volume, bulk density, particle density, types of isotherms.

(3) Agreement concerning the description of finely divided solids by indication of the adsorption per gram of adsorbent of gases such as nitrogen, argon, etc.

(4) Convention in naming colloidal systems, e.g. coacervates, synaeresis, tactosols, etc.

(5) Symposia on special problems.

In order to facilitate the progress of work of the Commission, four Sub-Commissions have been brought into existence. These are as follows:

I.7.1 Sub-Commission A—Colloid Systems
I.7.2 Sub-Commission B—Solid/Gas Interfaces
I.7.3 Sub-Commission C—Liquid Interfaces
I.7.4 Sub-Commission D—Heterogeneous Catalysis

The Sub-Commissions have submitted reports:

Sub-Commission A Suggestions for nomenclature in the field of colloid science. Second revision, March, 1963. Prof. J. Th. G. Overbeek.

Sub-Commission B Terminology, Definitions, and Symbols (Solid/Gas Interfaces). February, 1963. Academician M. M. Dubinin.
Notes on the above by Prof. R. Haul, Dr. S. Brunauer, Prof. D. D. Everett, Prof. G. Schay, and Prof. B. R. Puri.

Sub-Commission C Symbols and Terminology on Liquid Interfaces. Prof. A. E. Alexander. 1963.

Sub-Commission D A Tentative Draft—of Definitions, Terminology and Symbols (Heterogenous Catalysis). December 24, 1962. Prof. J. Horiuti.—Comments by Prof. Burwell, February 20, 1963, and Prof. Prettre, May 8, 1963.

Sir Eric Rideal
Chairman

I.8 Joint Commission on Applied Radioactivity

This Joint Commission did not meet in London.

REPORT ON FUNDAMENTAL CONSTANTS

by FREDERICK D. ROSSINI, Special Observer for the International Union of Pure and Applied Chemistry at the meeting of the

Commission on Nuclidic Masses and Atomic Constants

of the International Union of Pure and Applied Physics held on July 17, 1963, at Vienna, Austria

Following is an excerpt from Document MN63-2, dated September 4, 1963, signed by Prof. H.E. DUCKWORTH, Secretary of the Commission named above, of which Prof. J. MATTAUCH is Chairman:

(2) Report on Fundamental Constants

DUMOND and COHEN presented their "Report to the Commission on Nuclidic Masses and Related Atomic Constants". This contained a list of "Recommended Values of the Physical Constants 1963" together with a brief description of the least-squares adjustment upon which they were based. (The material in the report had been presented by COHEN on the previous day to the Second International Conference on Nuclidic Masses and had been well received.)

A letter to MATTAUCH from U. STILLE (a Corresponding Member of the Commission) was then read. STILLE emphasized the need for general use of a consistent set of values of the fundamental contants. He revealed that the International Standards Organization (TC 12) is prepared to adopt the COHEN and DUMOND list if the Commission is prepared to encourage its use. He understood that the Commission on Physicochemical Data and Standards of IUPAC was also considering recommending adoption of the list (see below).

MCNISH reported that the U.S. National Research Council Committee on Fundamental Constants, of which he is Chairman, had carefully considered the COHEN–DUMOND list and had taken the following action: "...At the date of this report (April 26, 1963) the Committee recommends the list of values... for general use by workers who have need for a consistent set of constants. ...The purpose of this recommendation is to provide a uniform basis for the presentation of experimental data. The Committee encourages discussion and modification of these numbers at any time, and urges the development of additional experimental data for more accurate evaluation of these constants".

A letter from F.D. ROSSINI to MATTAUCH was then read. ROSSINI had attended the first part of the Conference as an Observer and Official Representative of IUPAC on Fundamental Constants. He stated that IUPAC is anxious to reach accord with IUPAP on the use of a single, self-consistent list of fundamental constants, and cited the adoption of the C^{12} standard as an outstanding example of the fruits of co-operation. He further stated that the appropriate groups belonging to IUPAC had reviewed the COHEN–DUMOND list and were prepared to recommend their use by chemists as "best values" with the understanding that they would be subject to revision from time to time.

The role of the Commission in «recommending» the use of sets of values was discussed at length. It was recalled that, at the time of our formation, we were instructed to "encourage the compilation and tabulation of data". It was agreed that our encouragement should only be extended to persons of undoubted competence, such as COHEN and DUMOND, but that such persons should then publish the results of their work on their own responsibility.

In keeping with this point of view, it was agreed to inform the General Assembly of IUPAP of Cohen and DuMond's important work in the following words:

The Commission on Nuclidic and Related Atomic Constants has encouraged two of its members, J.W.M. DuMond and E.R. Cohen, to prepare a self-consistent list of the most probable values of the fundamental constants. This list was presented to the Second International Conference on Nuclidic Masses held in Vienna, July 15–19, 1963. The Commission expects that these values will be widely used and will help to remove many of the confusions that have arisen from the use of differing sets of constants. In addition, it is expected that the appearance of this list will encourage further experimental work aimed at improving our knowledge of these values.

II. INORGANIC CHEMISTRY DIVISION

REPORT ON THE ACTIVITY

From June 1962 to June 1963

During the period covered by this report all the Commissions have continued to function normally.

II.1 Commission on Atomic Weights

This Commission has not met, though much consideration has been given to the question of its future activities. These are fairly sharply defined by the terms of reference and it will be for the members of the Commission to decide at the London meeting what steps are to be taken to keep the new table of atomic weights up to date.

II.2 Commission on Inorganic Nomenclature

This Commission has continued its work on a range of important topics. It will meet at Brighton shortly before the London meeting, at which there will be an "open session" of the Commission. The scope of present activities may best be judged from the agenda of the Brighton meeting. This includes items dealing with the formulation of rules for "group names", the nomenclature of hydrides and inorganic chain compounds and symbolism and nomenclature in the field of defect solid chemistry. In addition, the following topics will be considered in joint session with the Commission on the Nomenclature of Organic Chemistry: the nomenclature of organometallic compounds, the nomenclature of boron compounds, the nomenclature of phosphorus and arsenic compounds and the nomenclature of silicon compounds. It is expected that provisional recommendations will be made for some of these groups of compounds.

II.3 Commission on High Temperature and Refractories

The field of work covered by the Commission on High Temperatures and Refractories is well represented in the programme of the Congress. During the year 1962–1963 the Sub-Commission on Condensed States has continued its important activities in the publication of bibliographies. The scope has been extended by the inclusion of both Italy and the Argentine in the scheme, the former being represented by Prof. G. Bozza of Milan and Prof. G. De Maria of Rome and the latter by Prof. Carrea of Buenos Aires.

The Commission is participating in the organization of the Second International Symposium on High Temperature Technology to be held at Asilomar in September. Other activities, which are now being organized, are the study of methods for obtaining and measuring high temperatures and the compilation of tables of constants relating to the high temperature field. These matters will be considered further at the London meeting.

II.4 Commission on Geochemistry

This Commission will be meeting at London and will, in addition, organize a symposium in connection with the Congress. It is expected to use the occasion for further discussions of general questions of the Commissions activities and also of its relationship with other bodies.

Prof. H.J. Emeléus, President

REPORT ON THE ACTIVITY DURING THE LONDON CONFERENCE

Minutes of the Meeting of the Division of Inorganic Chemistry, London, July 6, 1963

Present: Prof. H.J. Emeléus, Prof. J.H. de Boer, Prof. V. Gutmann, Prof. K.A. Jensen, Prof. T. Batuecas, Prof. C.W. Coreens, Prof. W. Klemm (invited by the President as an observer).

II.1 Commission on Atomic Weights

Prof. Batuecas reports that Prof. Wichers has been elected as the new President of the Commission on Atomic Weights. Prof. Ölander became Vice-President and Prof. Guéron was reelected as the secretary of this Commission. It was propsed that 2 members of the Commission should be representatives in the IUPAC-Commission on Atomic Weights subject to approval by IUPAC. Prof. Mattauch and Prof. Cameron were suggested. The recommandation of the Commission on Inorganic Nomenlature (appendix A) was noted.

II.2 Commission on Inorganic Nomenclature

Prof. Jensen reported on the elections of this commission. Dr. Prue, Reading, will take Dr. Chatt's office as a secretary. Prof. Benard, Prof. Feitknecht und Dr. Rees will be elected as associate members, while Dr. Chatt and Dr. Fernelius are elected as Titular Members.

A Sub-Commission consisting of Jensen, Chatt und Malatesta will have a joint meeting with a Sub-Commission on Nomenclature of Organic Chemistry in January 1964. A meeting of the full Commission is requested to be held at the time and at the same place as the meeting of the Commission on Nomenclature of Organic Chemistry in summer 1964. The Division Committee agreed to recommend these requests to the Bureau. It was noted that Dr. Cheesman (Tasmania) will be in Europe in summer 1964 and will not ask for travel allowances from Australia to Europe

II.4 Commission on Geochemistry

Prof. Correns presented a resolution reached by his Commission (appendix B). This was extensively discussed. Prof. Klemm suggested that proposal a) (an International Union of Geochemistry) should be dismissed from the discussion and that proposal b) (a strong inter-union commission) may encounter difficulties since joint commissions must be paid by ICSU. It was finally decided to retain the Commission with a total number of 8 members for the duration of 2 years, i.e. to 1965 pending the decisions of the Rome-Conference of the International Union of Geological Sciences in October 1963. The Division Committee recommended to the Bureau that one member of this Commission be allowed to travel and subsistence allowances to attend this Conference provided that the representative lives in Europe.

The Division Committee agreed to discuss the future of this Commission at its meeting in 1965 in terms of the conclusions reached at the Rome Conference of IUGS.

The recommandation was made that the International Union of Geology may appoint 2 observers to the IUPAC Commission, who will not be allowed to travel- or subsistence allowances by IUPAC.

Prof. CORRENS asked for a symposium of the Commission on Geochemistry in connection with the IUPAC Congress 1965.

Symposia

The Division Committee agreed unanimously to give full support to sponsorship and the request for financial contribution to 8 ICCC (International Conference on Coordination Chemistry) in Vienna in September 1964. This recommandation was based on the great scientific value of this particular meeting. At the same time it was fully appreciated that proper coordination with future meetings should be arranged; it was agreed to initiate discussions to secure this objective and to meet the point of view of the Executive Committee.

A request by Prof. DESSY to give sponsorship to the International Symposium on Organometallic Chemistry in Madison (appendix C) 1965 was discussed, but no final decision was made.

Further Activities

In order to ensure proper activities in recent development in Inorganic Chemistry the suggestion was made to set up three sections:

(1) Section on the Solid State
(2) Section in Coordination Chemistry
(3) Section on Organometallic Compounds

The division committee agreed to explore such possibilities in the near future. Negotiations on this matter will be reported in 1965 with any recommandations which are thought to be appropriate.

V. GUTMANN
Secretary

Minutes of the Meeting of the Division of Inorganic Chemistry London, July 9, 1963

Present: Prof. DE BOER, Prof. EMELÉUS, Prof. GUTMANN, Prof. BATUECAS, Prof. CHAUDRON, Prof. CORRENS, Prof. INGERSON, Prof. JENSEN, Dr. WICHERS, Dr. LEWIS.

(1) The retiring President Prof. H.J. EMELÉUS opened the meeting and asked the new President, Prof. J.H. DE BOER to take the chair. Prof. DE BOER expressed thanks to Prof. EMELÉUS for his service as a Section-President.

(2) It was decided to have a President, a Vice-President, a Secretary and in addition to them 7 Titular Members on the Division Committee. In addition to that the retiring President will remain on the Division Committee for a period of two years. It was further agreed that the Chairmen of the Commissions would normally attend meetings of the Division Committee.

(3) The minutes of the last meeting on July 6, 1963, were unanimously approved. Prof. DE BOER pointed out that the Division Secretary should be fully informed about any activities within the Division.

(4) The final elections of the Members of the Division Committee and the Chairmen of the Commissions were unanimously approved:

1963–67	*President:* Prof. J.H. de Boer (Netherlands)
1963–67	*Vice-President* (President-Elect): Prof. J. Benard (France)
1959–67	*Secretary:* Prof. V. Gutmann (Austria)
	Members:
1963–67	Prof. J.H. Anderson (England)
1963–67	Prof. V. Caglioti (Italy)
1963–65	Prof. H.J. Emeléus (England)
1963–67	Prof. O. Glemser (Germany)
1963–67	Prof. R.W. Parry (USA)
1963–67	Prof. G. Schwarzenbach (Switzerland)
1963–67	Prof. V.I. Spitzyn (USSR)
1963–67	Prof. B.J. Trzebiatowska (Poland)
	Commission Chairmen
II.1	Prof. G. Wichers (USA)
II.2	Prof. K.A. Jensen (Denmark)
II.3.1	Prof. G. Chaudron (France)
II.3.2	Dr. B. Lewis (USA)
II.4	Prof. A.P. Vinogradov (USSR)

(5) Unanimous approval was given to a proposal to explore the possibility of creating sections within the division. The following possibilities were suggested:

(1) Section on the Solid State
(2) Section on Coordination Chemistry
(3) Section on Organometallic Compounds

(6) Prof. Chaudron reported the activities of the Commission on High Temperatures and Refractories. The Division Committee recommended the continuation of the 2 Sub-Commissions II.3.1 and II.3.2 for two more years. It wished to recommend a symposium on the "properties and uses of plasma" organized by the Sub-Commission on Gas in connection with the IUPAC Congress 1965. Dr. Lewis was adviced to approach the Organizing Committee of that Congress, subject to approval by the Council. It was further decided to recommend sponsorship to a symposium on the "Properties of Solids at High Temperatures" to be held in Paris in 1965. It was noted that no financial contribution by IUPAC will be necessary for this particular activity. The possibility of creating two independent Commissions was considered, but the matter was deferred for further discussion to the Commissions.

(7) It was decided to recommend provisional sponsorship to the International Symposium on Organometallic Compounds on scientific grounds, if the arrangement, when fully known, will be satisfactory to the Executive Committee.

(8) Prof. Jensen reported on the extensive activities of the Commission on Inorganic Nomenclature. The publication of amendments to the 1957-rules through proper IUPAC channels was recommended. It was also agreed to recommend to the Council the reelection of some members whose term of office has exceeded the normal maximum period.

(9) Prof. Ingerson suggested a close co-operation between the Commissions II.3 and II.4.

V. Gutmann
Secretary

APPENDIX

Resolutions passed by the Commission on Geochemistry at its meeting in London, July 6, 1963

A.

Whereas, Geochemistry impinges on most areas of natural science, and

Whereas, it would be very difficult to secure adequate support and co-operation from all disciplines concerned if Geochemistry were confined to, or represented principally by, a single existing union, and

Whereas, Geochemistry is recognized as a major branch of science, with many thousands of active workers all over the world,

Now, therefore, be it resolved

(1) That the Commission on Geochemistry formally express its preferences for the position of Geochemistry in the international scientific community in the following order:

(a) An international union of Geochemistry.

(b) A strong inter-union commission (or association) of Geochemistry, with ties to the union of Chemistry, Geological Sciences, Geodesy and Geophysics, Biological Sciences, and other such international groups as may be interested.

(c) An association (cf. *Section* in IUPAC) in the International Union of Geological Sciences, with ties similar to those in (b), above (i.e., specific representation of the respective unions by members of commissions and other groups of the association). In this case a Commission on Geochemistry, of reduced size, should remain in IUPAC.

(2) That copies of this resolution be sent to appropriate officers and other individuals in IUPAC, IUGS, IUGG and ICSU.

B. (Informal)

The Commission of Geochemistry has been pleased with its treatment in IUPAC and wishes to express the hope that it be continued as an active Commission in IUPAC until and unless a more appropriate arrangement is completed. (Perhaps with the International Union of Geological Sciences at its meeting in Rome, October 1963. It is strongly recommended that a representative of the Commission attend this meeting.)

Summary of Recommandations to Council on July 9, 1963, London

(1) That the Membership of the Division of Inorganic Chemistry and the Chairmen of the Commission be approved.

(2) That the Commission on Atomic Weights be continued for 4 years and that the Commissions on Nomenclature, High-Temperatures (both Sub-Commissions) and on Geochemistry be continued for 2 years, with the possibility of further continuation being recommended in 1965.

(3) That sponsorship with financial support be given to 8th International Conference on Coordination Chemistry in Vienna, September 1964.

(4) That a representative of the Commission on Geochemistry be sent to the meeting of IUGS in Rome in October 1963, this representative to reside in Europe.

(5) That approval be given to a symposium on Geochemistry in connection with the IUPAC-Congress in Moskow 1965.

(6) That a sub-commission of the Inorganic Nomenclature Commission consisting of 3 members meets in Basel in January 1964, and that the full Commission meets in France in July 1964 for at least 3 days.

(7) That a symposium on the "Properties of Solids at High Temperatures" to be held in Paris in 1965 be sponsored by IUPAC. This will not involve financial committments.

(8) That a symposium on the "Properties and Uses of Plasma" be held in Moskow in connection with the Congress in 1965; the Sub-Commission on Gas to make direct approach to the organizers of the Congress.

V. Gutmann
Secretary

II.1 Commission on Atomic Weights

Minutes of the 1963 meetings

The meetings were held on July 6 and 8, 1963, at University College, London. The following were present:

Titular Members: Prof. T. Batuecas, Chairman; Prof. A. Ölander, Vice-Chairman; Dr. A.E. Cameron, Prof. J. Guéron, Prof. J. Mattauch, Prof. H. Remy.

Associate Member: Dr. E. Wichers.

Excused: Prof. V. Caglioti.

Prof. Emeléus, de Boer and Gutmann were present during part of the July 8 Meeting.

(1) *Election of members*

The death of Prof. Briscoe, and the ineligibility of Prof. Batuecas, Mattauch and Caglioti (all having served two consecutive terms of four years) created four vacancies among the titular membership.

It was decided:

(a) to elect Dr. E. Wichers as titular member and chairman;
(b) to reelect as titular members (1963–1967): Dr. A. Cameron, Prof. J. Guéron, Prof. A. Ölander, Prof. H. Remy;
(c) to elect as titular members: Prof. A.H. Wapstra, Prof. N.N. Greenwood, Prof. H.G. Thode;

thus securing:

1 specialist in the precise determination of masses;
1 modern inorganic chemist;
1 specialist in isotopic abundances or (and) isotope effects.

(d) to elect as associate members: Prof. Batuecas and Prof. Mattauch (in view of their active interest in the Commission's work); Dr. J. Spaepen (head of the EURATOM Bureau of Nuclear Measurements, so as to have the benefit of a metrologist's assistance).

(2) *Points of nomenclature*

(a) The Commission voted against giving now a name to the unit mass.
(b) The Commission decided to retain its present name.
(c) The Commission noted that there are inconsistencies or (and) lack of precision in many terms used in relation with atomic and nuclidic species and recommended that a comprehensive effort by made be IUPAC to devise and sponsor a coherent set of words.

For instance:

mass number might give way to nucleon number.

(d) The Commission was informed that the Commission on Inorganic Nomenclature is prepared to reconsider the name for element 102 but that it does not have, as yet, sufficient information for a decision. The name "nobelium" therefore should be continued on a provisional basis.

(3) *1963 Tables*

(a) *Table of relative atomic weights 1963*

(i) It was decided not to make any change in the 1961 figures.

(ii) It was decided to add element 103 *Lawrencium* without designation of an isotope and with symbol *Lr*.

(iii) Therefore the 1963 Table should be identical to the 1961 Table but for slight modifications.

(iv) It was noted that new determinations now under way (copper, germanium) will likely lead to changes in 1965.

(b) *The radioactive elements 1963*

It was decided to change this Table. The new Table is appended. The Commission thanked Dr. K. WAY for her assistance to Dr. E. WICHERS in bringing the Table up to date.

(c) *Table of selected relative atomic masses 1963*

It was decided to add this third Table to the two traditional ones, in view of the increasing use of artificial elements and of samples of unusual isotopic composition.

(4) *Precision of the Tables*

The Commission felt that it would be desirable to assess the confidence to be placed in the Tables, and that Dr. WICHERS had made a most valuable approach to this problem in his paper "How good are the New Atomic Weights" (Analytical Chemistry 1963, *35*, No. 3, p. 23 A).

Dr. A. CAMERON was asked to take the responsibility of drafting a report on the subject, calling on the assistance of Commission members and of other colleagues whose help he might enlist.

(5) *Relations with IUPAP*

It was felt worthwhile to explore the ways of ensuring proper liaison with the IUPAP Commission on Atomic Masses and related constants.

Prof. MATTAUCH, as chairman of the latter Commission, and Professor DE BOER, as chairman of the Inorganic Chemistry Section of IUPAC, will take the necessary steps.

J. GUÉRON
Secretary

Table of Relative Atomic Weights 1963

BASED ON THE ATOMIC MASS OF $^{12}C = 12$

The values for atomic weights given in the Table apply to elements as they exist in nature, without artificial alteration of their isotopic composition, and, further, to natural mixtures that do not include isotopes of radiogenic origin.

The figures are the same as those of the 1961 Table. Element 103, Lawrencium, (symbol *Lr*) has been included.

Order of Atomic Number

Atomic Number	Name	Symbol	Atomic Weight	Atomic Number	Name	Symbol	Atomic Weight
1	Hydrogen	H	1.00797[a]	41	Niobium	Nb	92.906
2	Helium	He	4.0026	42	Molybdenum	Mo	95.94
3	Lithium	Li	6.939	43	Technetium	Tc	.....
4	Beryllium	Be	9.0122	44	Ruthenium	Ru	101.07
5	Boron	B	10.811[a]	45	Rhodium	Rh	102.905
6	Carbon	C	12.01115[a]	46	Palladium	Pd	106.4
7	Nitrogen	N	14.0067	47	Silver	Ag	107.870[b]
8	Oxygen	O	15.9994[a]	48	Cadmium	Cd	112.40
9	Fluorine	F	18.9984	49	Indium	In	114.82
10	Neon	Ne	20.183	50	Tin	Sn	118.69
11	Sodium	Na	22.9898	51	Antimony	Sb	121.75
12	Magnesium	Mg	24.312	52	Tellurium	Te	127.60
13	Aluminium	Al	26.9815	53	Iodine	I	126.9044
14	Silicon	Si	28.086[a]	54	Xenon	Xe	131.30
15	Phosphorus	P	30.9738	55	Caesium	Cs	132.905
16	Sulfur	S	32.064[a]	56	Barium	Ba	137.34
17	Chlorine	Cl	35.453[b]	57	Lanthanum	La	138.91
18	Argon	Ar	39.948	58	Cerium	Ce	140.12
19	Potassium	K	39.102	59	Praseodym.	Pr	140.907
20	Calcium	Ca	40.08	60	Neodymium	Nd	144.24
21	Scandium	Sc	44.956	61	Promethium	Pm	.....
22	Titanium	Ti	47.90	62	Samarium	Sm	150.35
23	Vanadium	V	50.942	63	Europium	Eu	151.96
24	Chromium	Cr	51.996[b]	64	Gadolinium	Gd	157.25
25	Manganese	Mn	54.9380	65	Terbium	Tb	158.924
26	Iron	Fe	55.847[b]	66	Dysprosium	Dy	162.50
27	Cobalt	Co	58.9332	67	Holmium	Ho	164.930
28	Nickel	Ni	58.71	68	Erbium	Er	167.26
29	Copper	Cu	63.54	69	Thulium	Tm	168.934
30	Zinc	Zn	65.37	70	Ytterbium	Yb	173.04
31	Gallium	Ga	69.72	71	Lutetium	Lu	174.97
32	Germanium	Ge	72.59	72	Hafnium	Hf	178.49
33	Arsenic	As	74.9216	73	Tantalum	Ta	180.948
34	Selenium	Se	78.96	74	Tungsten	W	183.85
35	Bromine	Br	79.909[b]	75	Rhenium	Re	186.2
36	Krypton	Kr	83.80	76	Osmium	Os	190.2
37	Rubidium	Rb	85.47	77	Iridium	Ir	192.2
38	Strontium	Sr	87.62	78	Platinum	Pt	195.09
39	Yttrium	Y	88.905	79	Gold	Au	196.967
40	Zirconium	Zr	91.22	80	Mercury	Hg	200.59

Atomic Number	Name	Symbol	Atomic Weight	Atomic Number	Name	Symbol	Atomic Weight
81	Thallium	Tl	204.37	93	Neptunium	Np	.....
82	Lead	Pb	207.19	94	Plutonium	Pu	.....
83	Bismuth	Bi	208.980	95	Americium	Am	.....
84	Polonium	Po	.....	96	Curium	Cm	.....
85	Astatine	At	.....	97	Berkelium	Bk	.....
86	Radon	Rn	.....	98	Californium	Cf	.....
87	Francium	Fr	.....	99	Einsteinium	Es	.....
88	Radium	Ra	.....	100	Fermium	Fm	.....
89	Actinium	Ac	.....	101	Mendelevium	Md	.....
90	Thorium	Th	232.038	102	Nobelium	No	.....
91	Protactinium	Pa	.....	103	Lawrencium	Lr	.....
92	Uranium	U	238.03				

[a] Atomic weights so designated are known to be variable because of natural variations in isotopic composition. The observed ranges are:

Hydrogen	±	0.00001	Oxygen	±	0.0001
Boron	±	0.003	Silicon	±	0.001
Carbon	±	0.00005	Sulfur	±	0.003

[b] Atomic weights so designated are believed to have the following experimental uncertainties:

Chlorine	±	0.001	Bromine	±	0.002
Chromium	±	0.001	Silver	±	0.003
Iron	±	0.003			

Table of Relative Atomic Weights 1963

BASED ON THE ATOMIC MASS OF $^{12}C = 12$

The values for atomic weights given in the Table apply to elements as they exist in nature, without artificial alteration of their isotopic composition, and, further to natural mixtures that do not include isotopes of radiogenic origin.

The figures are the same as those of the 1961 Table. Element 103, Lawrencium, (symbol *Lr*) has been included.

Alphabetical Order in English

Name	Symbol	Atomic Number	Atomic Weight	Name	Symbol	Atomic Number	Atomic Weight
Actinium	Ac	89	.....	Iodine	I	53	126.9044
Aluminium	Al	13	26.9815	Iridium	Ir	77	192.2
Americium	Am	95	.....	Iron	Fe	26	55.847[b]
Antimony	Sb	51	121.75	Krypton	Kr	36	83.80
Argon	Ar	18	39.948	Lanthanum	La	57	138.91
Arsenic	As	33	74.9216	Lawrencium	Lr	103	.....
Astatine	At	85	.....	Lead	Pb	82	207.19
Barium	Ba	56	137.34	Lithium	Li	3	6.939
Berkelium	Bk	97	.....	Lutetium	Lu	71	174.97
Beryllium	Be	4	9.0122	Magnesium	Mg	12	24.312
Bismuth	Bi	83	208.980	Manganese	Mn	25	54.9380
Boron	B	5	10.811[a]	Mendelevium	Md	101	.....
Bromine	Br	35	79.909[b]	Mercury	Hg	80	200.59
Cadmium	Cd	48	112.40	Molybdenum	Mo	42	95.94
Caesium	Cs	55	132.905	Neodymium	Nd	60	144.24
Calcium	Ca	20	40.08	Neon	Ne	10	20.183
Californium	Cf	98	.....	Neptunium	Np	93	...
Carbon	C	6	12.01115[a]	Nickel	Ni	28	58.71
Cerium	Ce	58	140.12	Niobium	Nb	41	92.906
Chlorine	Cl	17	35.453[b]	Nitrogen	N	7	14.0067
Chromium	Cr	24	51.996[b]	Nobelium	No	102	.....
Cobalt	Co	27	58.9332	Osmium	Os	76	190.2
Copper	Cu	29	63.54	Oxygen	O	8	15.9994[a]
Curium	Cm	96	.....	Palladium	Pd	46	106.4
Dysprosium	Dy	66	162.50	Phosphorus	P	15	30.9738
Einsteinium	Es	99	.....	Platinum	Pt	78	195.09
Erbium	Er	68	167.26	Plutonium	Pu	94	.....
Europium	Eu	63	151.96	Polonium	Po	84	.....
Fermium	Fm	100	.....	Potassium	K	19	39.102
Fluorine	F	9	18.9984	Praseodym.	Pr	59	140.907
Francium	Fr	87	.....	Promethium	Pm	61	.....
Gadolinium	Gd	64	157.25	Protactinium	Pa	91	.....
Gallium	Ga	31	69.72	Radium	Ra	88	.....
Germanium	Ge	32	72.59	Radon	Rn	86	.....
Gold	Au	79	196.967	Rhenium	Re	75	186.2
Hafnium	Hf	72	178.49	Rhodium	Rh	45	102.905
Helium	He	2	4.0026	Rubidium	Rb	37	85.47
Holmium	Ho	67	164.930	Ruthenium	Ru	44	101.07
Hydrogen	H	1	1.00797[a]	Samarium	Sm	62	150.35
Indium	In	49	114.82	Scandium	Sc	21	44.956

Name	Symbol	Atomic Number	Atomic Weight	Name	Symbol	Atomic Number	Atomic Weight
Selenium	Se	34	78.96	Thulium	Tm	69	168.934
Silicon	Si	14	28.086[a]	Tin	Sn	50	118.69
Silver	Ag	47	107.870[b]	Titanium	Ti	22	47.90
Sodium	Na	11	22.9898	Tungsten	W	74	183.85
Strontium	Sr	38	87.62	Uranium	U	92	238.03
Sulfur	S	16	32.064[a]	Vanadium	V	23	50.942
Tantalum	Ta	73	180.948	Xenon	Xe	54	131.30
Technetium	Tc	43	.....	Ytterbium	Yb	70	173.04
Tellurium	Te	52	127.60	Yttrium	Y	39	88.905
Terbium	Tb	65	158.924	Zinc	Zn	30	65.37
Thallium	Tl	81	204.37	Zirconium	Zr	40	91.22
Thorium	Th	90	232.038				

[a] Atomic weights so designated are known to be variable because of natural variations in isotopic composition. The observed ranges are:

Hydrogen	± 0.00001	Oxygen	± 0.0001
Boron	± 0.003	Silicon	± 0.001
Carbon	± 0.00005	Sulfur	± 0.003

[b] Atomic weights so designated are believed to have the following experimental uncertainties:

Chlorine	± 0.001	Bromine	± 0.002
Chromium	± 0.001	Silver	± 0.003
Iron	± 0.003		

The Radioactive Elements 1963

Order of Atomic Number

Atomic Number	Name	Symbol	Isotope	Half Life	Mode of Disintegration
43	Technetium	Tc	99	2.1×10^5y	β-
61	Promethium	Pm	147	2.5 y	β-
84	Polonium	Po	210	138.4 d	α
85	Astatine	At	210	8.3 h	α, e.c.
86	Radon	Rn	222	3.83 d	α
87	Francium	Fr	223	22 m	α, β^-
88	Radium	Ra	226	1622 y	α
89	Actinium	Ac	227	22 y	α, β^-
90	Thorium	Th	232	1.4×10^{10} y	α
91	Protactinium	Pa	231	3.2×10^4 y	α
92	Uranium	U	238	4.5×10^9 y	α
93	Neptunium	Np	237	2.1×10^6 y	α
94	Plutonium	Pu	242	3.8×10^5 y	α
95	Americium	Am	243	7.8×10^3 y	α
96	Curium	Cm	247	$>4 \times 10^7$ y	α
97	Berkelium	Bk	247	ca. 10^4 y	α
98	Californium	Cf	249	360 y	α
99	Einsteinium	Es	254	480 d	α
100	Fermium	Fm	253	3 d	e.c. α
101	Mendelevium	Md	256	ca. 1.5 h	e.c.
102	(Nobelium)	No	256	$\sim$8 s	α, fission
103	Lawrencium	Lr	257(?)	8 s	α

This table lists selected isotopes of the chemical elements, whether occurring in nature or known only through synthesis, that are commonly classed as radioactive. The listed isotope is the one of longest known half-life.

Table of Selected Relative Atomic Masses 1963

The number of current chemical operations performed on natural or artificial radioactive elements, medium lived radioactive elements, and on usual elements of unusual isotopic composition makes it often necessary to compute, from the atomic masses of individual isotopes and the isotopic abundances, what might be called the "effective relative atomic weight" of the actual product which is being handled.

This is why a separate "Table of Selected Relative Atomic Masses" will be, from now on, added to the traditional Table of Relative Atomic Weights and Table of Radioactive Elements. The relevant figures taken from the coherent recomputation of König, Mattauch and Wapstra (Nuclear Physics 1962, *31*, p. 18), are good to ±1 of the last decimal.

Name	Symbol	Atomic Number	Mass Number	Relative atomic Mass
Hydrogen	H	1	1	1.007825
Deuterium	D	1	2	2.014102
Tritium	T	1	3	3.016049
Lithium	Li	3	6	6.015126
		3	7	7.016005
Boron	B	5	10	10.012939
		5	11	11.009305
Carbon	C	6	12	12.000000
		6	13	13.003354
Nitrogen	N	7	14	14.003074
		7	15	15.000108
Oxygen	O	8	16	15.994915
		8	17	16.999133
		8	18	17.999160
Technetium	Tc	43	99	98.906
Promethium	Pm	61	143	142.911
			145	144.912
			147	146.915
Lead	Pb	82	204	203.9731
			206	205.9745
			207	206.9759
			208	207.9767
Radium	Ra	88	226	226.0254
Uranium	U	92	233	233.0395
			234	234.0409
			235	235.0439
			236	236.0457
			238	238.0507
Neptunium	Np	93	237	237.0480
Plutonium	Pu	94	239	239.0521
			240	240.0540
			241	241.0567
			242	242.0587

II.2 Commission on Inorganic Nomenclature

The Meetings were held on June 27–July 4, 1963, at Brighton (England) and on July 5, 1963 at London (England).

These minutes were recorded by Dr. J. CHATT and Prof. F. GALLAIS.

Inorganic Nomenclature

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Meeting at Brighton (England), June 27–July 4, 1963

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Meeting at Brighton

Present: K.A. Jensen (in the Chair), G.H. Cheesman, E.J. Crane, V. Gutmann (Secretary of Inorganic Chemistry Division), L. Malatesta, A. Ölander, H. Remy (from 28 June), J. Chatt and F. Gallais (Secretaries).

63/1 The use of D and T as symbols was considered. It was agreed to retain special names and symbols for the isotopes of hydrogen, deuterium and the symbol D for ^2H, and tritium and T for ^3H. The use of "deuterio" versus "deutero" was discussed and it was decided to recommend the use of "deuterio" when hydrogen has been replaced by deuterium; similarly "tritio".

63/2 There was a general discussion of the definition of the unit of atomic mass, whether it should be 1/N (N = Avogadro Number) or $^1/_{12}$ of the mass of ^{12}C. Professor Gutmann informed the Commission that the question of "atomic weight" versus "atomic mass" was to be raised again by the Commission on Atomic Weights in London, and that this should be a Division decision.

Since our Commission favoured the term atomic weight it was agreed to appoint a Sub-Commission to prepare a statement setting out the reasons for our preference. This to be presented at the Division Meeting in London 1963 by our Chairman. The Sub-Commission was G.H. CHEESMAN (convenor), V. GUTMANN and A. ÖLANDER.

If a mass unit were adopted it was agreed to recommend the name "dalton" as a tribute to Dalton's prominent contribution to the development of the Atomic Theory.

The Sub-Commission reported on July 2 as follows:

"Atomic Weights" or "Relative Atomic Masses"

The quantities designated by the terms "atomic weight" and "relative atomic mass" are both *pure numbers*. The mass dimension only enters when the actual atomic mass is considered; it is derived from the former by division by the Avogadro number, which has, in fact, the dimension of a reciprocal mass. From dimensional considerations it is quite irrelevant whether the term "atomic weight" is retained or whether it is replaced by the term "relative atomic mass". Since the former is a well-established term with a definite meaning which has been used by chemists for a very long time without giving rise to any confusion, the Commission on Nomenclature recommends that "atomic weight" be retained inasmuch as the other alternative might be confused with the atomic mass of a single isotopic species. If it is felt, however, that the term "atomic weight" should be abandoned for some reason, then it should be replaced by a term which indicates that it is actually a pure number.

The suggestion has been put forward that the term "atomic weight" may be replaced by "Dalton-number". This term has the advantage of emphasising the essentially numerical character of the quantity concerned and can be defined as the ratio of the average mass of atoms present, expressed in any unit, to $^1/_{12}$ of the mass of the ^{12}C atom expressed in the same unit, regardless of what unit may be employed.

Some chemists and physicists have discussed a unit of $(6.02 \times 10^{23})^{-1}$ g in relation to atomic weights, to be called a "dalton". We consider that this may prove a useful unit of mass when dealing with essentially isotope questions; but for purely chemical purposes this unit has only a very limited usefulness. (Signed) G.H. CHEESMAN, Convenor

63/3 Arising from the report that the Commission on Atomic Weights wished to open again the question of "atomic weight" versus "atomic mass" although the Division agreed to retain "atomic weight" under two years ago, the opinion was expressed that IUPAC decisions on nomenclature should be valid for many years. Otherwise national chemical bodies may cease to take IUPAC nomenclature seriously. This is particularly true in the present instance, where nothing new is involved and the decision to retain "atomic weight" should stand for at least five years.

63/4 *Nobelium and Lawrencium.* Prof. SEABORG had written stating that he and his co-workers had not been able to reproduce the experiments carried out in Stockholm and alleged to produce element No. 102, which had been named Nobelium. He had obtained an isotope with a different half-life. In his letter he objected to the name "nobelium" but he did not propose another name. After discussion it was suggested that E.J. CRANE should ask Prof. SEABORG if he could not accept the name "nobelium" which is now so widely used. It was also suggested that A. ÖLANDER should ascertain the present views of the Swedish group on this subject.

Lawrencium, element No. 103. Following the observation by H. REMY that "w" is an uncommon letter in many languages and difficult to pronounce it was proposed to alter the spelling to Laurentium. The Chairman emphasized that the Commission had no right to modify the spelling of the name, but that it could be pronounced according to the custom of the language. To make the name more acceptable it was decided to recommend the chemical symbol Lr and not Lw for element 103.

63/5 *Comments on the 1957 Rules (The red book)*

Comments received on the 1957 Rules from the national nomenclature committees were considered.

1. Names of elements. It was noted that niobium is now the most generally accepted name for element No. 41, but that "niccolate" had not proved popular for "nickelate".

1.15 Since "deuterium" and "tritium" have been accepted as names for ^{2}H and ^{3}H, these names and the symbols D and T should be entered in the Table on p. 8.

1.22 Owing to inconsistent use of the term "metalloid" in different countries it was proposed to recommend its abandonment, and to classify the elements as metallic, semi-metallic and non-metallic.

2.16 The substance N_4S_4 should systematically be named nitrogen sulphide, but chemically it behaves as a nitride, and is better named sulphur nitride. It was decided to delete N_4S_4 as a bad example of this rule.

2.251 To avoid confusion the prefix "mono" should generally be retained. Delete the sentence: "The prefix mono may generally be omitted."

3.14 "Oxonium" is now receiving general acceptance as the name of the ion H_3O^+, and the name "hydronium" should be abandoned. Delete the sentence: "The widely used term hydronium should be kept for the cases where it is wished to denote an indefinite degree of hydration of the proton as for example in aqueous solution."

2.252 Experience since the "red book" was published shows that the Stock notation may be applied usefully to compounds of non metals. Delete the sentence: "The Stock notation can be applied to both cations and anions, but should preferably *not* be applied to compounds between non-metals."

3.221 After long discussion as to whether the O_2^- ion should be called "Superoxide" or "hyperoxide" it was decided to retain hyperoxide, because in German and Scandinavian languages "superoxide" is in popular use for (hydrogen) peroxide. It was decided to retain tri-iodide (I_3^-) and similar names for homopolyatomic anions. Where confusion would arise with tri-iodides containing three iodide ions ($3\ I^-$) this could be avoided by using "trisiodide".

3.32 As "vanadyl" is used to denote both VO and VO_2 the name should be deleted from the list of such names, also delete the sentence starting on p. 34, line 15, "In like manner, VO may be vanadyl (V), vanadyl (IV) and vanadyl (III)". It was decided to delete POCl from the list on p. 34 because it is a bad example and to replace "pyrosulphuryl" by "disulphuryl" in the same list. It was decided to retain sulphinyl and sulphonyl.

4.2 The use of mineralogical names was discussed and it was decided to make no change to this rule.

5.2 It was reaffirmed that polyatomic is correct in this title and that the alternative heteroatomic would be too restrictive as it would exclude such ions as I_3^- and S_3^-.

5.213 It was agreed to retain "orthoperiodic acid" for H_5IO_6 and that the use of "ortho" should be compulsory. Periodic acid would be HIO_4. Similarly H_6TeO_6 is "orthotelluric acid" the use of "ortho" being compulsory. The brackets around "ortho" in the names of these acids in the table on p. 48 should be deleted.

5.22 and 7.312 Objection has been made to the use of "peroxo", and arising from a long discussion of this abbreviation of "peroxido" it was decided to recommend the abandonment of all abbreviated forms in 7.312 including "peroxo" and "oxo" except when "oxo" is used with reference to a mono-co-ordinated oxygen atom.

The exceptions in 7.312 were originally allowed because they were in common use but they lead to ambiguity and confusion especially in the names of organometallic complexes.

Examples: dichlorophenylbistriethylphosphinenickel $[Ni(C_6H_4Cl)_2(PEt_3)_2]$
dichlorobistriethylphosphinenickel $[NiCl_2(PEt_3)_2]$
chlorochlorophenylbistriethylphosphinenickel $[NiCl(C_6H_4Cl)(PEt_3)_2]$
trichloroethyleneplatinate ion $[PtCl_3(C_2H_4)]^-$

All such difficulty is removed if the abbreviated forms of table 7.312 are abandoned. For example the above compounds would now be named:

dichlorophenylbistriethylphosphinenickel,
dichloridobistriethylphosphinenickel,
chloridochlorophenylbistriethylphosphinenickel,
trichloridoethyleneplatinate ion

The sulphur ligands in table 7.312 present difficulty because of ambiguity in the use of disulphide. Does it mean S_2^{2-} or $2S^{2-}$. This was resolved by the proposal that such ligands as S^{2-}, $S_2{}^{2-}$, $S_3{}^{2-}$, etc. should be named sulphido, disulphido, trisulphido, etc., and $2S^{2-}$, $3S^{2-}$ etc. should be bissulphido, trissulphido, etc.,

e.g. $[As\ S_4]^{3-}$ is the tetrakissulphidoarsenate ion or thioarsenate ion (see rule 5.23 below)

All "thio" forms should be deleted from the table and the use of "thio" restricted as set out in 5.23.

Similarly hydroxo and methoxo should be replaced by hydroxido and methoxido, but methanethiolate should be retained.

These "o" ligand names should be considered as formed by changing the final "e" of the anion name to "o" without changing the pronunciation of the preceding vowel.

5.23 "Thio" should be retained to designate substitution of oxygen by sulphur in trivial anion and acid names, and "sulphido" used when the oxygen atoms are named,

e.g. H_3PO_3S monothiophosphoric acid or sulphidotrioxophosphoric acid.

6.33 It was agreed that the alphabetical order of anion names should be permissive in naming double salts.

7.25 Order of inorganic ligands. Requests had been received from American and British chemists for an alphabetical order of ligands to be used. This was discussed very thoroughly, and it was agreed to permit alphabetical order as an alternative to the existing rule.

It appeared that this change of rule together with the change proposed in rule 7.312 (see 5.22 above) would allow the placement of all ligands in alphabetical order, without first sorting into types according to 7.25, 7.251 and 7.252. Thus all ligands could be placed in alphabetical order without leading to confusion if the change proposed in rule 7.312 were agreed. Their character would be indicated as follows:

Ligand type	*Distinguishing feature*	*Exceptions*
anionic	end in "o"	See rules
uncharged	name of molecule unchanged	7.322 7.323 and 7.324
bridging	u-prefix	

Examples: $(C_2H_5)_3P$ — Pt — I, Br, $PH(CH_3)_2$

trans-bromidodimethylphosphineiodidotriethylphosphineplatinum

$(C_2H_5)_3P$, Cl — Pt (μ-SPh)₂ Pt — Cl, $P(C_2H_5)_3$

trans-di-μ-benzenethiolatodichloridobistriethylphosphinediplatinum

7.312 See 5.22

7.323 The Commission noted the difficulty of applying Stock numbers to nitrosyl compounds. In such cases it was agreed that the ion charge may be indicated by Arabic numerals in the form (2–), (1–) (1+), etc. after the ion name. The form (–2), (–1), etc. could not be used because in spoken names it would lead to confusion with Stock numbers (–II), (–I), etc.

7.41 Bridging ligands. The positions of the bridging ligands (μ-ligands) in the names of polynuclear compounds was considered. If a completely alphabetical order of ligands were used and the abbreviated forms of 7.312 abandoned, the placing of μ-ligands alphabetically among the other ligands appears to raise no difficulty.

7.6 Wolframatophosphate etc. versus wolframophosphate.
It was considered premature to make any change. Change must await more structural data and examples.

63/6 It was agreed that a new edition of the 1957 rules should have an index.

63/7 *Names of Sub-Groups in the Periodic Table.* The proposals of the Sub-Commission on Group Names were discussed and also the opinions of the National Societies and individuals who had tendered their opinions.

Owing to lack of uniformity in the use of "A" and "B" to designate the Sub-Groups their use was now being abandoned in some countries. In such circumstances the Commission does not wish to encourage the use of these

letters or of any particular form of the Periodic Table. Nevertheless it recommends that when "A" and "B" are used the letters should be capitals, and used to designate only the Sub-Groups excluding all elements from Periods 1, 2 and 3. "A" and "B" should be used without implication of electronic structure or resemblances to the elements of Periods 2 and 3. The first Sub-Group in each Group is to be designated A and the second B as follows:

1A	2A	3A	4A	5A	6A	7A
K	Ca	Sc	Ti	V	Cr	Mn
Rb	Sr	Yt	Zr	Nb	Mo	Tc
Cs	Ba	La×	Hf	Ta	W	Re
Fr	Ra	Ac+	[Th]	[Pa]	[U]	

1B	2B	3B	4B	5B	6B	7B
Cu	Zn	Ga	Ge	As	Se	Br
Ag	Cd	In	Sn	Sb	Te	I
Au	Hg	Tl	Pb	Bi	Po	At

× Including the lanthanoids (lanthanides)

+ Including the actinoids (actinides), but thorium protactinium and uranium may also be placed in Groups 4, 5 and 6, in square brackets, as indicated.

63/8 *Transition element.* The following definition was accepted: "A transition element is an element whose atom has an incompleted *d*-shell, or which gives rise to a cation or cations with an incompleted *d*-shell."

63/9 *Lanthanoids.* In general usage "lanthanoid" is now favoured over "lanthanide" and it was agreed by a majority vote (one against) to recommend the abandonment of the term "lanthanide". The Commission noted that the distinction drawn in the 1957 Rules (Rule 1.21) between "lanthanides" (lanthanoids) and the "lanthanum series" may no longer be necessary and inclines to the view that the terms "lanthanide" and "lanthanide series" may be abandoned and replaced by the term "lanthanoid" which would include lanthanum and elements numbers 58 to 71.

It was agreed that when the termination "ide" has been used with similar meaning, as in "actinides" and "uranides" it should now be changed to "oid".

63/10 *Actinides and Uranides.* By common usage the term actinide now includes actinium and it is proposed that with the abandonment of "actinide" the term "actinoid" be used to include actinium and lawrencium in exact analogy with the lanthanoids. The same should apply to the uranoids (U-Lr) and to the curoids (Cm-Lr).

63/11 *Rare earth Group.* Other divisions of the rare earth Group were considered outside the scope of the Commission.

63/12 *The neutron.* The Commission discussed whether the neutron should be considered as element number zero, but decided that this was a matter of definition rather than nomenclature.

63/13 *The numbering of positions in complex compounds.* It was agreed to ask W.C. Fernelius to prepare a document.

63/14 *Inorganic chain compounds.* An extension of the rules proposed in the document entitled "Nomenclature of Inorganic Chain Compounds" by K.A Jensen (August 1961) was considered. Inorganic chains containing two sorts of atoms in alternate positions are common as in the silicones:

Si—O—Si—O—Si—O—Si

and polyphosphoric acids:

P—O—P—O—P—O—P

These may be named e.g. siloxanes and phosphoxanes, where the chains start and end with silicon and phosphorus atoms respectively.

The chain should not include end functional groups, e.g. OH, Cl. NH_2 etc., as defined in the Organic Rules relating to the oxa-aza convention.

The first atom of the repeating unit would come first in the name of the chain, prefixed so as to indicate the number of such atoms in the chain,

e.g. CH_3—Si—C—Si—C—Si—CH_3
tetracarbsilane

HO—Si—C—Si—C—Si—OH
dihydroxytrisilcarbane

HO—Si—O—Si—O—Si—OH
dihydroxytrisiloxane

[These proposals were later discussed in greater detail in joint session with the Organic Commission when they were modified and extended as indicated in the minutes of the joint session.]

63/15 *Defect solid structure chemistry.* A Sub-Commission of J. Benard, W. Feitknecht, G.H. Cheesman, A.L.G. Rees and A. Ölander, with G.H. Cheesman as convenor and secretary was appointed to report on this to the next meeting of the Commission.

63/16 *New members.* The Chairman read a letter from W. Feitknecht stating that he had been appointed Rector in Berne and had little time to give to nomenclature. After an expression of thanks for his considerable past services to the Commission it was decided to recommend his election as an Associate Member so that he might remain in touch with the work of the Commission. It was also decided to recommend that W.C. Fernelius become a Titular Member in his place, that A. L. G Rees become an Associate Member, and that K. Yamasaki become a Corresponding Member. J. Chatt expressed the desire to relinquish his appointment as secretary to the Commission. This, together with the increasing scope of inorganic chemistry makes it necessary to add an additional titular member to the Commission. It was agreed that the Chairman should explore with the Section Officers means of doing this.

63/17 *Sub-Commission on the Nomenclature of the Organic Derivatives of the Elements.* The Chairman reported that the Organic Commission had proposed that a new joint Sub-Commission of three members from each of the Inorganic and the Organic Commissions be appointed to draft the rules formulated by the joint Sub-Commissions on organometallic compounds including boron compounds, on chain compounds, and on phosphorus and arsenic compounds. This was agreed, and K.A. Jensen, J. Chatt and L. Malatesta were appointed, with J. Chatt as convenor. [The terms of reference, etc. of the new joint Sub-Commission were agreed in joint session with the Organic Commission and recorded in the minutes of the joint sessions.]

63/18 *Sub-Commission on the Nomenclature of Co-ordination Compounds.* It was agreed that if an additional titular member to act as secretary was granted (63/16) a new Sub-Commission should be appointed to consider the Fernelius' document on the numbering of positions in complex compounds, and the effect of using alphabetical order to determine the sequence of ligand names in naming co-ordination compounds. W.C. Fernelius was to be a member of this Sub-Commission.

Meeting at London

July 5, 1963

Present: K.A. JENSEN (in the Chair), H. BASSETT, G.H. CHEESMAN, E.J. CRANE, A. ÖLANDER, H. REMY, J. CHATT and F. GALLAIS, (Secretaries).

63/20 The minutes of the meetings held in Brighton, June 27–July 4, were read, and approved. With reference to minute 63/18 G.H. CHEESMAN reported that Dr. J.E. PRUE of Reading University would be willing to undertake the joint secretaryship of the Commission in J. CHATT's place, if it became possible to appoint him a Titular Member of the Commission.

II.3 Commission des Hautes Températures

II.3.1 Sous-Commission des Etats condensés

Trois réunions ont eu lieu au cours de la Conférence de Londres, les 6 et 8 juillet.

Séance de la Commission du 6 Juillet

Cette première séance qui a eu lieu le samedi 6 juillet de 9.30 h à 12.30 h a réuni l'ensemble de la Commission avec les personnes suivantes:

Prof. B. LEWIS (Etats-Unis), Président de la Sous-Commission «Gaz», Président de la séance

Pour la Sous-Commission «Gaz», outre le Prof. B. LEWIS,

Prof. W. LOCHTE-HOLTGREVEN (Allemagne), Membre Titulaire
Prof. E. STARKMAN (Etats-Unis), Secrétaire

Pour la Sous-Commission «Etats condensés»

Prof. F. TROMBE (France), Membre Titulaire
Prof. H. FLOOD (Norvège), Membre Titulaire
Dr M. FOEX (France), Secrétaire
Dr J.J. DIAMOND (Etats-Unis), Membre Associé
Prof. G.D. RIECK (Hollande), Membre Associé
Dr N.F.H. BRIGHT (Canada), Membre Associé
Dr L.R. BARRETT (Angleterre), Membre Associé
Dr K.G. McWHIRTER (Angleterre), Observateur
Prof. J. FLAHAUT (France)

Au cours de cette première séance la Commission a examiné une première fois les différentes questions qui furent abordées ensuite dans les séances du lundi 8. Un travail préparatoire y a été effectué. Les sujets traités figurent dans le compte rendu des séances du 8 juillet.

Séance du 8 juillet

La Sous-Commission «Etats condensés» s'est réuni le lundi 8 juillet entre 9 h. et 11 h. sous la présidence du Professeur G. CHAUDRON (France), Président de la Commission des Hautes Températures.

Assistaient à cette séance, outre le Prof. G. CHAUDRON:

Membres Titulaires: Prof. F. TROMBE (France), Prof. H. FLOOD (Norvège).

Secrétaire: Dr M. FOEX (France).

Membres Associés: Dr J.J. DIAMOND (Etats-Unis), Prof. G.D. RIECK (Hollande), Dr N.F.H. BRIGHT (Canada).

Observateurs: Prof. R. FLAHAUT (France), Prof. W. TNEBIATOWSKY (Pologne).
Les différentes questions suivantes ont été examinées au cours de cette séance:

Travaux d'ordre bibliographique

L'organisation actuelle semble donner satisfaction tant en ce qui concerne l'etablissement des bibliographies qu'en ce qui concerne leur distribution. Il conviendrait cependant de faire encore un effort pour atteindre toutes les personnes susceptibles d'être intéressées par ce travail dans les différents pays. Il est à noter que le champ d'action s'est étendu depuis 1961 à d'autres pays comme l'Amérique du Sud et que l'on dispose actuellement d'un plus grand nombre de correspondants.

Il serait utile d'établir des relations plus étroites avec l'URSS, en adressant directement les bibliographies aux spécialistes de ce pays. Ces derniers pourraient envoyer en échange des tirages-à-part relatifs à leurs travaux.

Etablissement des tables de constantes.

Il avait été décidé lors des réunions de Montréal d'établir des tables de constantes spécialisées dans le domaine des hautes températures. A cette époque, différents groupes avaient été constitués, l'un d'entre eux devant travailler en France sous la direction du Prof. F. Trombe. Ce dernier a déjà réuni une documentation de base importante sur les sujets suivants: Points de fusion, points d'ébullition, conductibilité thermique, chaleurs spécifiques, densités, dilatations, propriétés mécaniques, conductibilité électrique, facteurs d'émission. Ces tables seront éditées avec le concours de l'organisation des Tables Internationales de Constantes, dont le siège est à Paris, cet organisme étant lié à l'IUPAC. La Commission accorde son patronage à cette réalisation.
Le Docteur Diamond fait part à la Commission du projet américain de remplacement des anciennes «International Critical Tables» (National Academy of Sciences), par de nouvelles tables publiées en coordonnant les efforts des différents services américains, tels que le «National Bureau of Standards», «Atomic Energy Commission»...

Le Docteur Diamond signale également qu'une table critique sur le point de fusion des oxydes établie par le Docteur S. K. Schneider, et éditée par le National Bureau of Standards paraîtra en septembre prochain.

Recherches de substances étalons pour les mesures relatives aux hautes températures

Le Docteur Diamond indique que différents groupes du National Bureau of Standards de Washington travaillent aux questions de produits étalons, dans le domaine des points de fusion et des tensions de vapeur, qu'il s'agisse de métaux ou d'oxydes.

Etablissement de listes de spécialistes et de listes de Laboratoires spécialisés.

Il est décidé de procéder à une mise à jour de ces listes au cours des deux prochaines années.

Organisation de symposiums

A la demande la Commission des Hautes Températures, réunie à Montréal, l'IUPAC a accordé son patronage au Symposium sur la Technologie des Hautes Températures, qui doit se réunir à Asilomar (Californie) du 8 au 11 septembre prochain.

Le Docteur Diamond indique que le National Bureau of Standards désirerait réunir un Symposium sur la mesure des points de fusion et des points de transformation des produits réfractaires. La date exacte de ce congrès n'est pas encore fixée.

Le Prof. Chaudron fait part à la Sous-Commission du projet de la Commission Française des Hautes Températures d'organiser à Paris, en 1965, un Symposium sur les hautes températures, patronné par le Centre National de la Recherche Scientifique (France) et groupant 40 participants, dont 20 étrangers. Le sujet exact pourrait être choisi d'une façon plus précise après entente avec les organisateurs du colloque du Bureau of Standards de Washington.

Enfin la Sous-Commission examine avec intérêt le projet de Symposium sur les «Plasmas et leurs Applications». Ce Symposium devait primitivement avoir lieu cette année dans le cadre du Congrès de Londres, et son orga-

nisation avait été confiée au Prof. THRING de Sheffield. Ce projet a été en principe reporté en 1965.

Composition de la Sous-Commission

Le mandat des différents membres titulaires est maintenu jusqu'en 1965. La composition de la Sous-Commission devra subir à cette époque des modifications sensibles, tant en ce qui concerne les membres titulaires que les membres associées. En outre il serait intéressant d'augmenter le nombre des observateurs nationaux, afin de faciliter les contacts avec les différents pays et de promouvoir les progrès de la chimie des hautes températures, dans les régions où cette spécialité n'a pas encore pris un développement suffisant.

Séance plénière de la Commission du 8 juillet

Une réunion de l'ensemble de la Commission a réuni entre 11 h. et 12.30 h le 8 juillet, les différentes personnes suivantes:

Président de la Commission: Prof. G. CHAUDRON (France), Président de Séance

Pour la Sous-Commission «Etats condensés», en dehors du Prof. CHAUDRON

Membres Titulaires: Prof. F. TROMBE (France, Prof. H. FLOOD (Norvège).

Secrétaire: Dr M. FOEX (France).

Membres Associés: Dr J.J. DIAMOND (Etats-Unis), Prof. G.D. RIECK (Hollande), Dr N.F.H. BRIGHT (Canada).

Observateur: Prof. J. FLAHAUT (France).

Pour la Sous-Commission «Gaz»

Prof. B. LEWIS (Etats-Unis), Président de la Sous-Commission «Gaz».

Membres Titulaires: Prof. W. LOCHTE-HOLTGREVEN (Allemagne), Prof. M.W. THRING (Angleterre).

Secrétaire: Prof. E. STARKMAN (Etats-Unis).

Membre Associé: Prof. L. DEFFET (Belgique).

Sur la proposition du Prof. CHAUDRON, son Président, la Commission des Hautes Températures réunie dans son ensemble approuve les décisions prises par chacune des deux Sous-Commissions.

Elle approuve en particulier les questions relatives à l'établissement de tables de constantes et celles concernant l'organisation des différents symposiums prévus.

Le Symposium sur les «Plasmas et leurs Applications» intéresse les deux Sous-Commissions, car il doit comporter une partie physique et une autre chimique. Mais il a été décidé, à la demande du Prof. LEWIS, d'en confier son organisation aux membres de la sous-commission «Gaz» et en particulier au Prof. THRING. En principe ce Symposium doit avoir lieu à Moscou, dans le cadre du prochain Congrès de l'IUPAC.

Les décisions relatives à la Sous-Commission «Gaz» figurent dans le rapport établi par le Professeur STARKMAN.

II.3 Commission on High Temperatures and Refractories

II.3.2 Gaseous States Sub-Commission

London, July 8, 1963

Present: Dr. B. LEWIS, President (USA); Prof. M.W. THRING; Prof. E.S. STARKMAN, Secretary (USA); Prof. W. LOCHTE-HOLTGREVEN, Member (Germany); Prof. L. DEFFET, Associate Member (Belgium).

The Sub-Commission on Gaseous States met separately on July 8, and jointly with the Sub-Commission on Condensed States on July 6 and July 8. The minutes of the joint meetings will be prepared and submitted by Dr. FOEX, Secretary of the Commission on High Temperatures and Refractories and shall not be included here except for certain pertinent confirming actions. Two principal items of business were considered, the organization of the Symposium on Plasmas for the IUPAC Congress in 1965 and the continuing composition of the Sub-Commission.

I. *Organization of the Symposium on Properties and Applications of Plasmas*

It was learned that the intent at this writing was for the Conference of IUPAC *in 1965* to take place in Paris, and the Congress *in Moscow*, thus the locale of the Plasma Sympsium would be Moscow. It was agreed that Prof. THRING continue with the organising he had already commenced for the aborted 1963 planning. It was agreed that he be aided by the constituting of a corresponding committee as follows:

Prof. THRING for United Kingdom and Chairman
Prof. LOCHTE-HOLTGREVEN for Germany
Prof. DEFFET for Belgium and Holland
Dr. LEWIS and Prof. STARKMAN for USA
Prof. MANSON for France
Prof. LEHNERT for Sweden
Prof. SCHEYNDLIN for USSR

A tentative programme outline was agreed upon as follows.

A. Physics of Plasmas

1. Physical data and theories of Plasma.
(Among other subjects to include electron-ion recombination coefficients, power generation (MHD) theory, etc.)

2. Experimental Techniques.
(Shock tubes, spectrometry etc.)

Plenary lecture for above including mention of gaseous lasers to be given by Prof. LOCHTE-HOLTGREVEN (Accepted)

B. Chemistry of Plasmas

1. Chemical Reactions in Plasma.
(Chemical transformation and spectroscopy)

2. Application of Plasma.
(Among others, results of MHD studies)

Proposed plenary lecture by Prof. SCHEYNDLIN, Director of High Temperature institute, Engergetika Institute, Moscow. To be invited by Prof. THRING.

For the Symposium, both invited and contributed papers will be sought. Prof. THRING already has an extensive solicitation list and agreed to supply names, as applicable, to the individual members of the corresponding committee for further contact.

It was agreed that the technical sessions are to be single and continuous, with no two taking place simultaneously. Three days of meetings are anticipated and an attendance of 400 to 500 people including USSR attendees is anticipated.

Dr. Lewis agreed to present the above proposed programme and request for inclusion in the 1965 IUPAC Congress at the meeting of the Inorganic Chemistry Division on July 9, 1963, in order to establish the request at the very earliest date possible.

(The above proposal and actions were later given concurrence and approval by the whole body of the Commission on High Temperatures and Refractories).

II. *Continuing and Future Composition of the Sub-Commission.*

It was learned that action was being taken by council to establish a rule of 8 Titular Members and 4 Corresponding Members, maximum on any one Commission, with Sub-Commission having to conform in total. In anticipation of a formal request for such conformity, and in the interest of the future works of the Sub-Commission, a discussion of the immediate and near future composition of the Sub-Commission was undertaken in order to satisfy the requirements of no more than 4 Titular Members and 2 Corresponding Members per Sub-Commission. The following recommendation was agreed to:

For 1963–1965

President: Dr. B. Lewis (USA)

Vice-President: Prof. M.W. Thring (United Kingdom)

Secretary: Prof. E.S. Starkman (USA)

Member: Prof. W. Locht-Holtgreven (Germany)

Associate Members: Prof. L. Deffet (Belgium); Dr. G. Wagner (Germany)

Observers: As previously but in addition:
Dr. B. Karlovitz (USA); Prof. Scheyndlin (USSR)

For 1965–1967

President: Prof. N.W. Thring (United Kingdom)

Secretary: Prof. E.S. Starkman (USA)

Members: Prof. L. Deffet (Belgium) Dr. G. Wagner (Germany)

Associate Members: Prof. N. Manson (France); Dr. B. Karlovitz (USA)

Observers: To be added as required and indicated.

(The above proposal was given concurrence and approval at the later meeting of the whole Commission).

III. *Other Matters*

Prof. Deffet presented a request from the Commission on Thermodynamics and Thermochemistry for verbal support in a proposal project on the collection and publishing of critical properties (P, V, T) for certain selected industrial gases. The Sub-Commission indicated its agreement that this was a worthwhile project and was happy to see the work being undertaken. It was requested that consideration also be given to higher temperatures than the 500 degrees proposed and to higher pressures than were being considered. It was additionally suggested that a proposal for further work needed in the field be incorporated as a part of the task.

Also discussed was the present status of the abstracts and their distribution and a proposed approach to Prof. LEO BREWER on the subject of subdividing the abstracts according to category along the lines of the outline incorporated in the Minutes of the 1961 meeting of the Sub-Commission.

Adjourned at 11.00 a.m. for joint meeting with Sub-Commission on Condensed States as a meeting of the Commission on High Temperatures and Refractories.

E.S. STARKMAN
Secretary

II.3.2 Sub-Commission on Gas

Meeting at University College, London, Sunday, July 7, 1963, 9 p.m.

Present: Prof. M.W. THRING, E.S. STARKMAN, Dr. B. LEWIS.

An advertisement for the Plasma Physics Conference was inserted into several journals (BJAP, Nature, JRIC) just over 12 months ago and subsequently concelled-lists of interested personnel were compiled and filed. Names of possible speakers were received—but no direct approach to those concerned made. (.Eg. Prof. Dr. W. LOCHTE-HOLTGREVEN (Kiel) suggests we approach Dr. POST-LIVERMORE, Dr. LEHNERT (Stockholm) ,Prof. LAPORTE (Ann Arbor) Prof. MANDELSTAM (Moscow), Dr. KING (ERA), for specialist lectures) (John Margrave suggests T.B. REED (MIT), M. THOYNE, Thermal Dynamics (Lebanon), N.H. A.V. GROSSE (Philadelphia, Pa.).

Bureau of IUPAC met in Brussels in June 17–18, 1962. "With regard to the possible organization of a special symposium on plasma physics and high temperatures etc., no resolution was passed but the general feeling expressed was that it would be highly advisable for IUPAC to take great interest in this rapidly developing field of science".

Suggest: a special symposium for approx. 12 months hence—in this country—Scope very open (see wording) include MHD and materials problems—e.g. 3 day meeting:

Day 1. Properties of Plasma—fundamentals.

Days 2 and 3. Application of Plasma
(i) Physical—including Power Generation.
(ii) Chem. Properties. Chem. Reactions at very high temperature.

If decided upon, then suggestions for formation of an Organizing Committee etc., e.g. Central Committee consisting of at least one man from each country (as far as possible) to deal quickly with any matters arising "locally".

II.4 Commission on Geochemistry

Minutes of the meeting of the Commission held at University College, London, England, Saturday and Monday, July 6 and 8, 1963.

July, 6

After calling the meeting to order President CORRENS suggested that Item C of the Agenda, the Place of Geochemistry in International Scientific Organizations, be discussed first, because he would be obliged to report the feelings of the members of the Commission at a meeting of the Section of Inorganic Chemistry that afternoon. He reported that Prof. KLEMM had transmitted the following relevant decisions of the Bureau of IUPAC:

(1) If the Commission remains in IUPAC, there could be full co-operation with other unions, such as IUGG and IUGS.

(2) The Bureau decided to recommend against an inter-union organization for Geochemistry.

(3) If the Commission decides that it would be more appropriate for it to be in one of the earth science unions (e.g., IUGS), IUPAC would be willing to send two representatives (as Associate Members ?) to the Commission.

(a) If this solution is adopted, there would be no objection to maintaining a small Commission on Geochemistry in IUPAC, if this appears desirable.

WAGER expressed the opinion that the ideal arrangement would be to have a separate international Union of Geochemistry and that, failing this, the next best thing would be a strong inter-union commission or association.

SUGAWARA said he had the impression that VINOGRADOV's attitude is that Geochemistry should adhere to Chemistry, but SMALES said that Analytical Chemistry, and probably most of the other Sections of IUPAC, have little or no interest in Geochemistry.

INGERSON reminded the group that the Geochemical Society was organized as an international society and might still be able to perform the functions envisioned for an international union or an inter-union association, if it is not possible to realize either of the latter two.

After some further discussion, INGERSON moved to submit (through President CORRENS) to the Section of Inorganic Chemistry of IUPAC a resolution expressing the preferences for the position of Geochemistry in the international scientific community. A priority was agreed on, and the Secretary was requested to draft the resolution and to have copies prepared for transmission to IUPAC. At SMALES' suggestion a second resolution was passed expressing pleasure at the treatment the Commission has received in IUPAC and hope that it could be continued in IUPAC until and unless a more appropriate arrangement is completed. (See Appendix I for copies of the resolutions.)

Item B *Next Meeting*

It was decided that the next meeting of the Commission should be held at the same time and place as the next meeting of IUPAC (Moscow, 1965).

It was also decided to request approval for the holding of a symposium at the time of the next meeting. After a discussion of all of the topics that had been suggested, it was decided that a comprehensive coverage of one topic would be better than partial treatment of several.

Accordingly, it was voted to recommend a 4- or 5-day symposium on the origin and abundance of the elements. A two-man committee (AHRENS and INGERSON) was appointed to prepare a suitable title for the symposium and

to suggest a breakdown of topics that should be included. The committee was instructed to report progress to the other members of the Commission from time to time.

July 8

Item D *Reports of Officers and Committees*

President CORRENS reported that other Commissions have been much more active than has the one on Geochemistry (production of books and other publications; active committees, etc.). We need a specific *mission* to justify continuation as a Commission.

The President also suggested that it might be efficient to have the business meeting in 1965 in Paris, at a time when it would not conflict with the Moscow Symposium. [Shortly before or after, so that both could be done on a single trip? E.I.]

There were no formal reports of committees, but there was a lengthy discussion of the scope and functions of the Committees on Rock Analyses and on a Code of Analytical Methods, because several members felt that the work of these committees might well constitute the chief mission of the Commission in the immediate future. It was decided to sharpen the Commission's functions by eliminating the other committees (Geochemistry of the Oceans; Geochemistry of Organic Compounds; Beginning of the Biosphere).

It was agreed that, since the Committee on Rock Analyses has not been able to aid in the revision of Professional Paper 99 (analyses of igneous rocks), it should, henceforth, make its principal task an attempt to secure general agreement on a method of presenting analyses of igneous and metamorphic rocks in publications.

The Chairman of the Committee on Code of Analytical Methods (WICKMAN) was asked to write out a statement of what he would recommend with respect to the Code. This statement will then be circulated to the other members of the Committee and of the Commission. If agreement can be reached on this statement, or a modification thereof, it should be published in the IUPAC journal for the attention of the appropriate chemical and geochemical journals, with a request for comments, suggestions for changes and additions, etc.

As a corollary of the work of this Committee it was suggested that various methods and laboratories be compared by replicate analyses (at least four) of the geochemical standards available at the National Bureau of Standards (Washington). Much of this work could be done in the laboratories represented by the members of the Commission, but should be broadened to include other selected laboratories.

No mechanism for activating this program was established and no new committee or sub-committee was appointed, so presumably the initiative must rest with the Chairman and members of the Committee on a Code of Analytical Methods.

Item A *Election of Officers; Revision of Membership*

Since it is highly probable that IUPAC will study the Commission very carefully in 1965 and decide whether it should be continued in the Chemical Union beyond that date, it was decided to have the terms of all officers and new members terminate in 1965. The following officers were elected:

Chairman: A.P. VINOGRADOV, Vice-Chairman: EARL INGERSON, Secretary: L.H. AHRENS.

The following new Titular Members of the Commission were also elected:

MARIO FORNASERI, Rome; JAMES B. THOMPSON, Cambridge, Massachusetts.

The terms of four other members had expired, which reduces the membership to eight, the number indicated by IUPAC as desirable. (See page 79 for list of current Titular Members and their addresses.)

Observers

The revised statutes of IUPAC, which were adopted at the London meeting in July, 1963, provide that, henceforth, observers will be "invited by the chairman of a commission to take part in its work". Thus, observers are appointed for a particular meeting, with respect to its subject interest and location and do not continue to serve indefinitely or even for four year terms, as do Titular and Associate members.

Therefore, the names of all Observers have been removed from the rolls of the Commission and the new Chairman will invite such observers as he may choose for the next meeting. Note that Observers do not have to be approved by the Division, as do members; it is required only that the Chairman supply the names of the Observers of the General Secretary of the Union. (See Statutes, July 1963, p. 9.)

No *Associate Members* have yet been appointed to the Commission. However, Dr. MORF, General Secretary of IUPAC, has suggested that perhaps there should be representatives from other divisions (quondam *sections*) of IUPAC and from other unions (at least IUGG and IUGS). It is planned to invite these groups to nominate representatives and if they do so, presumably the representatives will serve as associate members of the Commission.

On invitation from the Commission Dr. IRVING BREGER organized a Symposium on the Fate of Lignin in Geological Environments. This was considered to be an appropriate theme, because the London meeting of IUPAC emphasized Organic Chemistry. The sessions were held at Imperial College on July 8 and 9. The Proceedings of the Symposium will be published as a special issue of *Geochimica et Cosmochimica Acta* early in 1964.

APPENDIX I

Resolutions passed by the Commission on Geochemistry

at its meeting in London, July 6, 1963, and transmitted to IUPAC

A.

Whereas, Geochemistry impinges on most areas of natural science, and

Whereas, it would be very difficult to secure adequate support and co-operation from all disciplines concerned if Geochemistry were confined to, or represented principally by, a single existing union, and

Whereas, Geochemistry is recognized as a major branch of science, with many thousands of active workers all over the world,

Now, therefore, be it resolved

(1) That the Commission on Geochemistry formally express its preferences for the position of Geochemistry in the international scientific community in the following order:

(a) An international Union of Geochemistry.

(b) A strong inter-union commission (or association) of Geochemistry, with ties to the Unions of Chemistry, Geological Sciences, Geodesy and Geophysics, Biological Sciences, and other such international groups as may be interested.

(c) An association (cf. Division in IUPAC) in the International Union of Geological Sciences, with ties similar to those in (b) above (i.e., specific representation of the respective Unions by members of commissions and other groups of the association). In this case a Commission on Geochemistry, of reduced size, should remain in IUPAC.

(2) That copies of this resolution be sent to appropriate officers and other individuals in IUPAC, IUGS, IUGG, and ICSU.

B. (Informal)

The Commission on Geochemistry has been pleased with its treatment in IUPAC and wishes to express the hope that it be continued as an active commission in IUPAC until and unless a more appropriate arrangement is completed. (Perhaps with the International Union of Geological Sciences at its meeting in Rome, October, 1963. It is strongly recommended that a representative of the Commission attend this meeting.)

III. ORGANIC CHEMISTRY DIVISION

REPORT ON THE ACTIVITY

From June 1962 until May 1963

Since my last report on the activities of the Section of Organic Chemistry two Symposia have been held, one in Prague, 27 August–2 September, 1962, and one in Florence, 17–19 September, 1962.

The Prague Symposium, the second International Symposium on the Chemistry of Natural Products, was excellently organized and attended by over 600 participants. Professor F. Šorm, President of the Czechoslovak Academy of Science, has given a full report on this important meeting which appeared in the Information Bulletin (Number 17, 1962, p. 17). It now appears to become a tradition that IUPAC sponsored meetings on natural product chemistry are organized every two years. The first symposium was held in Australia in 1960 and a third will take place in Kyoto 12–18 April, 1964.

The Florence Symposium on Pharmaceutical chemistry was likewise a great success thanks to the great efforts of Prof. P. Pratesi and A. Soldi. It was attended by some 400 people and the lectures were given in the famous Sala Bianca of Palazzo Pitti, an exceptionally beautiful phrame for a scientific meeting.

The Symposium was closed by the late Prof. E.J. King who held an inspired speech thanking the organizers on behalf of IUPAC. This was probably the last public appearance of Prof. King whose untimely death is much regretted.

Apart from the London Congress, 10–17 July, 1963, there will be Symposia on "Chemistry and Biochemistry of Fungi and Yeasts" in Dublin, 18–20 July, 1963, organized by the late Prof. T.S. Wheeler and Prof. Eva Philbin and a Symposium on Nitrocompounds in Warsaw 18–20 September, organized by Prof. T. Urbanski.

The great activity of the natural product chemists, very unfortunately has not been counterbalanced by a similar activity of those chemists whose main interest is theoretical organic chemistry. The reason for this is unclear. Much work has been done to create interest in IUPAC and its activities among our theoretical colleagues but the results have been fairly meagre. However, Prof. G. Hammond, Pasadena, is presently investigating the possibilities of holding a Symposium on "Organic Photochemistry", and Prof. H.A. Staab, Heidelberg, is planning a "Wittig-Symposium" on "New Developments in the Field of Organic Phosphorus Chemistry". The latter will probably be held in Heidelberg in April, 1964.

It is our intention to increase the number of section members by adding some representatives for theoretical organic chemistry in the hope that they will act as useful catalysts for meetings in their field.

The enormous growth of the organic chemical literature is a matter of ever increasing concern to all organic chemists. It has been suggested, particularly by the Secretary General, Dr. Morf, that a study group for information retrieval should be created within IUPAC. There appear to be different opinions about this proposal since the problem is being actively studied by the American Chemical Society and others. The usefulness of such a study group will be discussed when the Section Committee meets in London. It is felt, also by Prof. P.E. Verkade, President of the Commission

on Codification, Ciphering and Punch card-indexing, that this Commission has finished its work; it has had no meeting for several years. Consequently this Commission should either be dissolved or reorganized.

The growing interest in chemical taxonomy makes international co-operation in this field a matter of importance. It is felt that chemotaxonomic research would be greatly facilitated by the publication of a mailing list of botanists and foresters able and willing to help chemists to obtain authentic plant materials and that some co-ordination of the present studies is needed. It is probably too early to create a new commission for this purpose; an *ad hoc* committee might suffice for the present time. It is believed that chemotaxonomic studies would provide useful starting points for the development of organic chemistry in many parts of the world, a matter in which IUPAC is vitally interested.

Prof. H. ERDTMAN
President

III.1 Commission on Organic Nomenclature

During its Columbus meeting in 1961 the IUPAC Commission on the Nomenclature of Organic Chemistry had finished its work on the tentative version of Section C of its revision and extension of organic chemical nomenclature. A Drafting Committee was appointed to bring this version in good shape. As a result of the work of this Committee the "Tentative Rules for Nomenclature of Organic Chemistry, 1961 (Section C. Characteristic groups containing carbon, hydrogen, oxygen, nitrogen, halogen, sulfur, selenium and/or tellurium)" have been published by Butterworth for IUPAC at the end of 1962.

It may be useful to explain the new notion of "characteristic group" here. A characteristic group is an atom or group that is incorporated into a parent compound otherwise than by a direct carbon—carbon linkage, but including groups $—C{\equiv}N$ and $C{=}X$ where X is O, S, Se, Te, NH, or substituted NH. The above-mentioned rules thus deal with halogen derivatives, alcohols, phenols, aldehydes, ketones, carboxylic acids and derivatives, sulfur derivatives, compounds containing nitrogen, etc.

These Rules have been sent to the Adhering Organizations asking for remarks and comments before 1 March, 1964. The Commission will then prepare the final text of the Rules in question.

In July, 1962 the Commission met for about a week at Elsinore (Denmark), partly together with a number of members of the IUPAC Commission on the Nomenclature of Inorganic Chemistry. The main topic was the nomenclature of compounds containing characteristic groups not yet dealt with in Section C, *i.e.* the metalorganic compounds in a broad sense (derivatives of metals, P, As, Sb, Bi, Si, etc., also B). Rules for the nomenclature of such compounds will be brought together in Section D of the Commission's work. Moreover, stereochemical problems (Section E) and carbohydrate nomenclature were discussed.

A set of Rules for carbohydrate nomenclature prepared by an Anglo-American Commission has been published in the IUPAC Information Bulletin. Here again the Adhering Organizations have been asked for remarks and comments concerning these Rules, to be offered before 1 October, 1963. After that date the Commission will start the preparation of an international set of rules for carbohydrate nomenclature, together with the IUPAC Commission on the Nomenclature of Biological Chemistry and a number of specialists in the field.

Prof. P. VERKADE
Chairman

REPORT ON THE ACTIVITY DURING THE LONDON CONFERENCE

Meeting of the Division Committee in London

The following members were present: H. Erdtman, President (Sweden), L. Marion, Vice-President (Canada), T. Urbanski, Secretary (Poland), A. Kjaer, Member (Denmark), K. Nakanishi, Member (Japan), G. Ourisson, Member (France), F. Weygand, Member (West Germany)

It was agreed that Prof. Marion should revise the By-Laws of the Division to conform with the new statutes and that the Division Committee should have the following composition:

One President elected for two years, one President-Elect elected for two years, one Secretary nominated by the President, and seven members, generally elected for four years. It was recommended, however, that one of these members should be the immediate past president, serving as past president for two years.

The following were elected (years of service within brackets):

President: L. Marion, Canada (1963–1965)

President-Elect: F. Weygrand, Germany (1963–1965)

Secretary: T. Urbanski, Poland (1961–1965)

Members: P. Bartlett, USA (1963–1967); D.H.R. Barton, England (1963–1967); H. Erdtman, Sweden (Past President) (1963–1965); A. Kjaer, Denmark (1962–1966); K. Nakanishi, Japan (1961–1965); G. Ourisson, France (1961–1965); O. Reutov, USSR (1963–1967).

The future of the Commission on Codification, Ciphering and Punched Card Techniques was discussed at some length. This Commission has not met for some time and since Prof. Verkade had mentioned to the President that in his opinion the Commission had fulfilled its duties, the general opinion was that it should be dissolved.

Future Symposia were discussed. The Committee agreed to recommend IUPAC to sponsor the following two Symposia:

(1) "New developments in the chemistry of organic phosphorus compounds", to be held in Heidelberg in 1964. It was pointed out, however, that this Symposium ought to be held at a date which would not cause any collision with the Symposium on Natural Products to be held in Kyoto, Japan, in April 1964.

(2) A "Moses Gomberg Centenary Symposium" on the chemistry of free radicals planned to take place in Ann Arbor, Mich. (USA) in August 1966.

The Division had received news about a Symposium on "Conformational Stereochemistry of Alicyclic Systems" planned to be held in Prague in 1966, and also news of a conference on a similar topic that is planned to held in Switzerland during the same year. It was found necessary to ascertain that these two meetings will not coincide and it was suggested that the scope of the Prague meeting might be somewhat widened.

No definite news was then available about the Symposium on Organic Photochemistry which Dr. G. Hammond, Pasadena, had agreed to organize.

The need for systematic investigations in the field of natural product chemistry was discussed. It was pointed out by several members that the interest in chemical taxonomy was presently rapidly increasing, as shown by the large number of papers in this branch of chemistry recently published

either by organic chemists, pharmacologists or botanists. It was the opinion of those present that it would be an important task for IUPAC to bring scientists interested in chemical taxonomy together for mutual discussions and efforts to promote the development of chemical taxonomy. It is obvious that many phytochemists have experienced great difficulties in procuring authentic plant materials. The publication in suitable journals, e.g. Phytochemistry, of lists of botanists, foresters, etc., who could help in this respect, would be of great value. These lists should be revised from time to time.

The publication of annual reports on plant constituents and their distribution would be of very great importance to phyto- and chemotaxonomists. It was also pointed out that chemotaxonomic studies might serve as useful growing points for chemistry in hitherto technically underdeveloped countries. It was felt that the time was not yet ripe for the creation of a commission on chemotaxonomy but that an *ad hoc* committee should be formed to discuss this matter in detail and report back to the Division Committee. The following members of the *ad hoc* committee were suggested: H. Erdtman, Chairman, E.C. Bate-Smith, R. Hegnauer, A. Kjaer, L. Marion and G. Ourisson. [This group and Dr. T. Swain, Cambridge (England), met in Leiden, November 19–20, 1963, and will meet again in Kyoto in connection with the Symposium on Natural Product Chemistry in Kyoto in April 1964. The Leiden meeting was sponsored by NATO.]

The President had learnt from Dr. Morf that WHO needed assistance from nomenclature specialists and it was agreed that Prof. L. Marion should further investigate this matter.

Prof. H. Erdtman
President

III.1 Commission on Organic Nomenclature

The IUPAC Commission on the Nomenclature of Organic Chemistry met at Brighton-Hove (England) on June 28–July 3, 1963, during the last three days together with the IUPAC Commission on Inorganic Nomenclature. The main topic was the discussion of the content of Section D of the Commission's revision and extension of organic chemical nomenclature, dealing with organometallic compounds, organophosphorus compounds, etc., organosilicon compounds, organoboron compounds and related topics. Very good progress was made. A sub-committee, consisting of three members of each of the two abovementioned nomenclature commissions, was appointed for bringing the rules in a form suitable for publication in a tentative form. This sub-committee will meet in January 1964 at Basle.

Other topics discussed were problems relating to Section C (characteristic groups) already published in a tentative form; the nomenclature of compounds containing labelled atoms, about which a tentative document will soon be published; carbohydrate nomenclature.

International Rules for carbohydrate nomenclature will be prepared on the basis of the Anglo-American report by a special committee, consisting of four members of the IUPAC Commission on Organic Nomenclature, two members of the IUPAC Commission on Biological Nomenclature, and six specialists in the field of carbohydrate chemistry. This sub-committee will meet in February 1964 at Basle.

During the London Conference of IUPAC the Commission held an open meeting, during which especially the Terentiev system for stereochemical notation was discussed.

Prof. P. Verkade
Chairman

IV. BIOLOGICAL CHEMISTRY DIVISION

REPORT ON THE ACTIVITY

From June 1962 (Brussels) until May 1963

The Division suffered a grievous loss in the death of its President, Professor EARL J. KING, late last year. Prof. KING will be sorely missed not only by the Division, but also by the Union, to which he gave so much of his time and efforts, and by the profession of chemistry throughout the world. The undersigned has agreed to complete Professor KING's term with much trepidation and with full realization of his inability to carry on as Professor KING would have.

It is the conviction of the undersigned that the Division of Biological Chemistry must continue in active existence, if for no other reason, to provide liaison between the International Union of Biochemistry (IUB) and the profession of chemistry, of which we are all a part, and which is represented at the international level by IUPAC. Discussions at the forthcoming meetings in London will be based on this theme, and efforts will be made there to implement this function of the Division by strengthening present programs and, hopefully, in the adoption of new ones. The proposed joint IUPAC/IUB Commission on Biochemical Nomenclature will be an important step in this direction.

IV.1 Commission on Nomenclature of Biological Chemistry

(1) The Commission met in Zurich on 29–30 April, 1963; 7 members were present. The Commission was honoured by the presence of Prof. P. KARRER (a former President of the Organic Section) at one of its sessions and of the Secretary General at several sessions. Subjects discussed included: amino acids, vitamins, peptides, and proteins (especially, the nomenclature of compounds in which one residue of a natural product is replaced by another residue). The Tentative Rules for Abbreviations and Symbols for Chemical Names of Special Interest in Biochemistry were further considered, and Revised Tentative Rules will be published shortly.

The work of the Sub-Commissions dealing respectively with the nomenclature of quinones, cyclitols, folic acids, and lipids was reviewed briefly.

The actions of the President and Secretary in making arrangements for the proposed joint IUPAC/IUB Nomenclature Commission were considered and approved.

(2) The Sub-Commission on the nomenclature of quinones with isoprenoid side-chains (Convenor, Prof. E.C. SLATER, Amsterdam) met in Zurich on 26 and 27 April, 1963; a report is in preparation.

(3) The other Sub-Commissions are continuing to conduct their business by correspondence. Subjects and convenors are as follows:

Cyclitols: Prof. S.J. ANGYAL, University of New South Wales, Kensington, N.S.W., Australia.

Folic acid derivatives: Prof. L. JAENICKE, Universität Köln, Germany.

Lipids: Prof. H. HIRSCHMANN, Western Reserve University, Cleveland, Ohio, USA.—(This Sub-Commission has recently been set up in agreement with the Editors Commission of IUB.)

The Convenors of these Sub-Commissions will be glad to receive suggestions regarding nomenclature problems in these fields from interested chemists and biochemists.

(4) The Sub-Committees who were charged with the task of making administrative arrangements to set up the IUB-IUPAC Joint Commission (E.C. Slater, W.V. Thorpe, W. Klyne) met in London on 8 March, 1963. Their proposals have been agreed upon in correspondence with Prof. J.T. Edsall (Chairman of the Editors Commission of IUB).

It is proposed that the Joint Commission should come into operation on 1 January, 1964, and that it should consist of 5 members nominated by IUPAC and 5 by IUB. It is desirable that some members of the present IUPAC Commission should continue to serve on the Joint Commission.

The administrative arrangements for setting up such a Joint Commission are necessarily rather complicated. However, what is important is not the form of the machinery, but the scientific knowledge and good-will of the people who are to work with it.

IV. 2 Proteins Commission

At the meeting of the Protein Commission in Munich in 1959 it was felt desirable to concentrate on two main tasks:

(1) To collect all available chemical and physical data relating to about fourteen well-defined, pure proteins.

(2) To make specifications on peptide substrates suitable for testing the specificity of proteolytic enzymes.

With regard to (1), names of workers particularly expert on individual proteins, both in and outside the Commission, were assembled, and these were circularized in the following Spring. Except in the case of lysozyme, no replies were forthcoming—nor indeed acknowledgements of the President's letters.

There seemed so little enthusiasm, and in the interim so many members of the Commission, including the Secretary, had reached the end of their tenure as members of the Commission, that it seemed desirable to wind up the Commission, and this was suggested in 1962.

It would still seem desirable to have available in one place these data for rapid and easy reference, but it may be appropriate to wait until more aminoacid sequences of the proteins concerned are fully known. It might also be relevant to consider whether the existence of the Commission is justified for the pursuit of these problems alone, or whether they could best be treated by review type articles such as already have appeared in established review journals. This latter policy has the advantage that it could focus attention on a given protein at a time most appropriate for comprehensive specification.

IV. 3 Clinical Chemistry Commission

The Commission will meet in Detroit, Michigan, 19–23 August, 1963, during the Vth International Congress on Clinical Chemistry. This will be the Vth Congress sponsored by the Commission since 1954. Major items of business coming before the Commission will include: (1) Proposed statutes and by-laws for the International Federation of Clinical Chemistry; (2) results of International Tests on Standard Methods conducted by Dr. MacLagan (UK); (3) consideration of proposals for clinical chemistry standardization and controls; (4) nomination of Titular Members and National Representatives; (5) election of Commission President and officers; (6) consideration of the application of the International Federation as an associated society of

IUPAC; and (7) proposals for the site and date of the VIth International Congress.

Interim activities of the Commission since its last meeting in Edinburgh (IVth Congress of Clinical Chemistry, August, 1960) have been primarily concerned with: (1) formation of new national societies of clinical chemistry; (2) their organization into an International Federation; (3) the preparation of a directory of national societies of clinical chemistry, their officers and addresses; and (4) tests on standard methods. The Federation now includes seventeen national societies of clinical chemistry. The directory is in preparation and will be printed and distributed within a few months.

The Commission here records its deep sorrow and great loss with the death of Prof. EARL KING (UK). It was through Professor KING's keen interest, untiring efforts, and great influence throughout the world of clinical and biological chemistry that the Commission came into being in 1952. The International Federation of Clinical Chemistry was also inspired, founded, and developed largely through his outstanding leadership. It is the hope and belief of this Commission that these contributions, as well as his acknowledged fame as a teacher, an author, and research leader, will be lasting monuments to his name and memory.

Four members, representing the Netherlands, Scandinavia, Germany, and United States, completed their terms of office in 1962 and 1963. Titular Members, representing Belgium and Switzerland, have been elected and confirmed. National Representatives for Czechoslovakia, Japan, Australia, United States, Germany, and the Netherlands have been nominated to the Commission. Nominations for National Representatives for Norway, Denmark, Sweden, and Finland have been requested and are in process.

Dr. MONROE E. FREEMAN (President) and Dr. BERTIL JOSEPHSON (Secretary) have completed their terms of office in 1962 and 1963. Prof. J.E. COURTOIS (France) has been nominated by Commission Members to succeed Dr. FREEMAN as President of the Commission in 1963.

WARREN M. SPERRY, President

REPORT ON THE ACTIVITY DURING THE LONDON CONFERENCE

The Division met in London during most of Saturday, July 6, 1963. Following are the principal actions taken or matters considered:

We recorded our grief at the loss by death of our former Division President, Prof. EARL J. KING, and of the chairman of the Protein Commission, Prof. KENNETH BAILEY.

The following eight biochemists from seven countries were elected to membership on the Division Committee and as officers as shown:

President: Prof. W.M. SPERRY (USA).

Vice-Presidents: Prof. V. OREKHOVITCH (USSR); Prof. A.H. ENNOR (Australia).

Secretary: Prof. M.M. RAPPORT (USA).

Members: Prof. J.E. COURTOIS (France) (President-Elect of the Commission on Clinical Chemistry); Prof. W. KLYNE (England) (President of the Commission on Nomenclature); Prof. E. KLENK (West Germany), Prof. T. UKITA (Japan).

[All of the foregoing have since accepted election.]

(1) Chairman FREEMAN (USA) reported on the work of the Commission on Clinical Chemistry which was to meet in Detroit in August at the time of the International Congress of Clinical Chemistry, sponsored by IUPAC. (A condensed report of that meeting is appended below.)

There are now associations or societies of clinical chemists in 18 countries. Many of these were organized, wholly or in a part, as a result of encouragement by the Commission, particularly through the good offices of its first President, Prof. KING, and of Dr. FREEMAN. In 1952, the societies then existing were formed into a loose International Federation of which, until now, the Commission has acted as the Executive Committee. Dr. FREEMAN has formulated Statutes and By-Laws which will make this Federation into a truly independent body, but whether or not these are adopted, close cooperation with the Commission is expected to continue. At no expense to IUPAC, Dr. FREEMAN has prepared a 24-page booklet which lists the officers of all known societies of clinical chemists and their addresses. (Copies may be obtained on request from Dr. MONROE E. FREEMAN, Science Information Exchange, 1026 16th Street, N.W., Washington, D.C. 20036.)

(2) Chairman KLYNE (England) reported on the work of the Nomenclature Commission. Much has been done in the adoption and publication of rules for nomenclature of several groups of compounds of biochemical interest and of official abbreviations. Several groups of compounds are under study by Sub-Commissions.

Prof. KLYNE also reported that his plan to form the Nomenclature Commissions of the Division and of the International Union of Biochemistry into a combined commission has been completed. Briefly, each of the two Commissions will have five members and each will preserve its autonomy in respect to its parent organization, but the two will meet and act as a unit with a member of the IUPAC Commission as President, and a member of the IUB Commission as Secretary at the start. This unusual plan, which has several advantages, was approved by the Committee, and later by the Council.

(3) The Commission on Proteins had reported before the death of its chairman, Prof. BAILEY, that it considered its work to have been completed,

and it asked to be discontinued. This request was approved by the Committee and later by the Council.

(4) We considered at length a proposal to form a Commission on the Teaching of Biochemistry to Medical Students. It was agreed to recommend that the Council should authorize a small *ad hoc* committee to study this proposal, if possible, in collaboration with a corresponding committee of IUB. The Council deferred action on this request until the Presidents of the Division and of IUB could discuss it.

(5) We considered a request that the Division and IUPAC should sponsor a symposium on Biochemistry of Nutrition to be held in South Africa in 1966 or 1967. In the absence of written information concerning the plans for this Symposium, the Committee was unable to adopt a recommendation concerning it. Later, Dr. Carman of South Africa prepared such a written statement which was distributed to the members of the Council, but the Council was unable to act in the absence of a recommendation by the Division, and the matter was turned back to us for further study. The Committee is now in the process of voting on the South African proposal.

(6) Several other matters of more general interest were discussed, such, for example, as the application of the new Statutes and By-Laws to the Division. It was agreed that we would attempt to formulate By-Laws of the Division as soon as possible.

IV.2 Commission on Clinical Chemistry

Meeting in Detroit, August 17, 1963

Report condensed from the Minutes as Submitted by former Chairman Monroe E. Freeman

Present were:

Titular members: Chairman, Dr. M. E. Freeman, (USA), Chairman-Elect, Prof. J. E. Courtois (France), Acting Secretary, Dr. B. Josephson (Sweden), Prof. N.F. MacLagan (England), Prof. V.N. Orekovitch (USSR), Dr. S.H. Jackson (Canada), and Dr. M.C. Sanz (Switzerland).

National Representatives: Prof. Y. Yamamura (Japan), Dr. D.H. Curnow (Australia), and Prof. E. Werle (West Germany).

Alternate National Representative: Dr. E.J. van Kampen (Netherlands).

(1) Several clinical chemists were nominated as Titular Members of the Commission. (Their names will be supplied after they have been approved by the Division as provided in XI. B. I. of the new Statutes.)

(2) Election of Officers of the Commission:

Chairman (to succeed Dr. Freeman): Prof. J. Courtois (France) was elected

Vice-Chairman: It was the consensus that no vice-president was required, and none was elected.

Secretary: Dr. M.C. Sanz (Switzerland) was elected.

(3) The results of the International Tests on a standard serum sample, conducted by Prof. MacLagan, were considered by the Commission for appropriate action. Discussion emphasized the following points:

(a) Since these tests were initiated (in 1961), a large number of standard serum samples has been developed by many agencies, commercial and other. The Commission does not have sufficient information on all these to arrive at a considered judgement, recommendation, or endorsement for an international standard serum sample.

(b) Prof. MacLagan's tests do, indeed, demonstrate that a given sample properly prepared does yield consistent results in the hands of selected and expert laboratories.

(c) Attempts to select, judge, and endorse an international standard require financial and laboratory resources that are not now available to the Commission.

(4) Date and Place of the VIth International Congress of Clinical Chemistry

(a) The tentative invitation from Jugoslavia for the VIth Congress in 1966 was withdrawn.

(b) The tentative invitation from Switzerland for the VIth Congress was withdrawn in favor of the VII Congress to be organized jointly by the French and Swiss societies.

(c) An invitation to hold the VIth Congress in München, Germany, in the summer of 1966, made by Prof. Werle on behalf of the clinical and biochemical societies of the Federal Republic, was unanimously accepted by the Commission.

(d) Dr. CURNOW (Australia) invited consideration of Australia as the site of the VIIth International Congress in 1969.

(e) The Commission recognized the invitations for the VIIth Congress (1969) from Australia and from France-Switzerland and will defer decision until the next meeting of the Commission.

(5) The Danish Society for Clinical Chemistry has asked the Commission to consider proposals for the endorsement of standard units of mass volume, etc., and to endorse common standards of concentration for clinical chemistry usage. Inasmuch as a symposium intended to consider these matters at length is scheduled for the Vth International Congress, consideration by the Commission is deferred until receipt of these proceedings.

V. ANALYTICAL CHEMISTRY DIVISION

REPORT OF NINTH MEETING (1963)

Place: London (England), Engineering Building at University College.

Date: Saturday, July 6, 2 p.m. to 5 p.m.: Division Committee and Chairmen and Secretaries of the Commissions
Monday, July 8, 9 a.m. to 11 a.m.: Division Committee
Monday, July 8, 11 a.m. to 1 p.m.: Open Meeting of the Division
Tuesday, July 9, 9 a.m. to 12 p.m.: Division Committee and Chairmen and Secretaries of the Commissions
Tuesday, July 9, 2.30 p.m. to 4 p.m.: Division Committee.

In the chair: Prof. H. MALISSA, Division President, part of time; Prof. R. BELCHER, Division Vice-President, part of time

Report prepared by Dr. P.N. DEGENS Jr., Secretary of the Analytical Chemistry Division

Attendance of the IUPAC-London Conference 1963

V. *Division Committee*

Prof. H. MALISSA, President (Austria); Prof. R. BELCHER, Vice-President (England); Dr. P.N. DEGENS, Jr., Secretary (Netherlands); Prof. I.P. ALIMARIN (USSR); Prof. G. CHARLOT (France); Prof. W. FISCHER (Germany); Prof. R. PRIBIL (Czechoslovakia); Prof. N. TANAKA (Japan); Prof. P.W. WEST (USA).—Absent: Prof. P. DELAHAY, with notice.

V.1 *Commission on Anal. Reactions and Reagents:*

Prof. S. VEIBEL, Chairman (Denmark); Dr. W.C. JOHNSON, Secretary (England); Prof. E. SAWACKI (USA); Dr. W.I. STEPHEN (England), Associated Member.

V.2 *Commission on Microchemical Techniques* (no Commission Meetings)

Dr. W. SCHÖNIGER, Secretary (Switzerland); Prof. H. SPITZY (Austria); Mr. G. INGRAM (England) Associated Member.

V.3 *Commission on Nomenclature*

Prof. F. BURRIEL-MARTI, Chairman (Spain); Dr. D. AMBROSE, Secretary (England); Prof. I.P. ALIMARIN (USSR); Prof. E. Bayer (Germany); Prof. G. CHARLOT (France); Prof. L. ERDEY (Hungary); Prof. E.B. SANDELL (USA).

V.4 *Commission on Spectrochemical and other Opticial Procedures for Analysis*

Dr. A. C. MENZIES, Chairman (England); Dr. E. LŒUILLE, Secretary (France); Prof. V.A. FASSEL (USA); Prof. H. KAISER (Germany); Dr. E.W. SALPETER (Italy); Dr. B.F. SCRIBNER (USA); Dr. H. GUYER (Switzerland), Associated Member; Prof. G. KORTÜM (Germany) Associated Member.

V.5 *Commission on Electroanalytical Chemistry*

Prof. I.M. KOLTHOFF (USA), Chairman and Secretary instead of Prof. P. DELAHAY (USA); Mrs. Dr. J. BADOZ-LAMBLING (France); Prof. W. KEMULA (Poland); Prof. G. KORTÜM (Germany); Prof. R.A. ROBINSON (USA);

Dr. R.G. BATES (USA), Associated Member; Prof. G. CHARLOT (France), Associated Member; Prof. N. TANAKA (Japan), Associated Member; Dr. E. VIANELLO (Italy), Associated Member; Dr. P. ZUMAN (Czechoslovakia), Associated Member

V.6 *Commission on Equilibria Data*

Prof. D.N. HUME, Chairman and Secretary (USA); Prof. J. BJERRUM (Denmark); Prof. H. FREISER (USA); Dr. J.C. HINDMAN (USA); Prof. A.E. MARTELL (USA); Dr. J. LEDEN (Sweden), Associated Member.

Observers

Mr. R.W. FERMELL (England); Prof. J. FUJINAGA (Japan); Prof. S. FUJIWARA (Japan); Prof. G. SEMERANO (Italy); Mr. A.A. SMALES (England).

Minutes of the Ninth Meeting of the Analytical Chemistry Division

(1) *Welcome*

The President, Prof. H. MALISSA, formally opened the meeting on Saturday, July 6, and extended a warm welcome to all those present. He hoped that the very full agenda would be dispatched without too much trouble in the next few days and that the meeting would be constructive.

(2) *Confirmation of Meeting Times*

The schedule for the meetings of the Division Committee and of the individual commissions, was reviewed and confirmed.

(3) *Report of the Eighth (1961) Division Meeting*

The report of the eighth Division Meeting at Montreal (Canada) in 1961 was approved, signed by the then President Prof. R. BELCHER, and handed to the Division Secretary, Dr. P.N. DEGENS Jr., for filing.

(4) *President's Report (1961–63) to Council*

The President read the draft of his report to the Meeting. The Chairmen and Secretaries of the Commissions had one or two comments, which were duly noted.

The President presented his report to Council on Tuesday, July 9.

Action: The President would send the official text of his report to the Division Secretary in time for it to reach the Secretary General by November 15, 1963, at the latest.

(5) *Election of New Division Committee Members*

The Chairman of the 1963 Nomination Committee, Prof. R. BELCHER, announced that on the basis of nominations received and the subsequent elections the following three new members were appointed to the Division Committee for the period 1963–1967:

Prof. J.A. GAUTIER for France; Mr. A.A. SMALES for the United Kingdom; Prof. A.K. BABKO for the USSR (appointed by the Soviet Academy of Science, according to a verbal communication from Prof. V.N. KONDRATIEV).

Prof. BELCHER then handed a report on the conduct of the elections, signed by the Nomination Committee (Prof. R. BELCHER, Prof. N. TANAKA and Prof. S. VEIBEL), to the Division Secretary for filling.

Prof. BELCHER also announced that the Nomination Committee would be drawing up a wider set of rules for the election of members to the Division Committee. These rules would be presented to the Division Committee for approval.

Prof. P.W. WEST was elected Vice-President (President-Elect) for the period 1963–1965, and so subsequently Division President for the period 1965–1969.

A resolution proposing that a Past President of the Division should not remain on the Division Committee for longer than two years was adopted.

The meeting then turned to the business of appointing the 1965 Nomination Committee—Prof. N. TANAKA (Chairman), Prof. A.E. MARTELL and Prof. J.A. GAUTIER being proposed.

Prof. TANAKA and MARTELL declared their willingness to sit on the Commission. Prof. GAUTIER, not being present at the Meeting, would be approached on the matter by the Division Secretary.

Action: (a) The Division Secretary would ask the Soviet Academy of Science for written confirmation of Prof. BABKO's membership.—(b) Prof. BELCHER would draw up wider election rules.—(c) The Division Secretary would write to Prof. GAUTIER.

(6) *International Analytical Congress*

The Division President was sorry to announce that the "Verein Österreichischer Chemiker" was not able to organize a IUPAC Conference, followed by an IUPAC Congress (with the central theme Analytical Chemistry), in Vienna in 1965. The IUPAC Conference in 1965 will now be held in Paris and the IUPAC Congress in Moscow.

To make the position quite clear, it was pointed out that IUPAC differentiated between three types of congresses:

(a) Official IUPAC congresses, so far held every two years (e.g. 1957, 1959, 1961, 1963) with scientific discussions centred on one main topic supplemented by two or three subsidiary topics, and with one of the Adhering Bodies acting as host.

(b) Congresses for which the organizing bodies sought and received IUPAC sponsorship (e.g Congress on Coordination Chemistry; Congress on Catalysis)

(c) Congresses not sponsored by IUPAC.

The meeting was of the opinion that another official IUPAC Analytical Congress might quite reasonably be organized within the next few years.

In a show of hands, only two of the nine Division Committee members present indicated that they would prefer an IUPAC Congress like the one in Lisbon in 1956, devoted exclusively to Analytical Chemistry. The remaining seven members were in favour of an IUPAC Congress with Analytical Chemistry as the main topic supplemented by two or three subsidiary topics.

A vote was also taken on the timing of such a congress. A motion proposing that an attempt be made to organize one in Europe in 1967 and to find an Adhering Body willing to act as host was carried by fice votes to nil with four abstentions.

After this resolution had been carried, the President, Prof. MALISSA, in view of strengthning of Analytical Chemistry still thought it advisable to put a request to the last Council Meeting, asking for Analytical Chemistry to be made one of the subjects of the 1965 IUPAC Congress in Moscow as well. It will remain to be seen whether such a request will be accepted by the organizing committee in Moscow. At this Council Meeting the Russian

delegates have been very much in favour about having Analytical Chemistry as one of the topics in Moscow.

As the justification for the existence of Analytical Congresses beside specialist analytical symposia was thought to need clarification, an *ad hoc* committee was appointed to look into the matter, Those appointed were: Prof. N. Tanaka (Chairman), Prof. I.M. Kolthoff and Dr. E. Loeuille. The Division Secretary said he was prepared to pass on any information he might have to the committee for further study.

Action: The Division Secretary would provide Prof. Tanaka with information concerning analytical congresses and symposia.—The President will take contact with the Russian colleagues.

(7) *By-Laws (Rules) for the Analytical Chemistry Division*

The new Draft IUPAC Statutes 1963 had been adopted by Council on the understanding that amendments could still be submitted within the next six months (up to January 1, 1964). Also, the individual Divisions had been asked to bring their own by-laws into line with the new IUPAC statutes.

An *ad hoc* committee was therefore appointed to prepare a report on these two points as they affected the Analytical Chemistry Division. The members appointed to the committee were: Prof. S. Veibel (Chairman), Dr. A.C. Menzies and Prof. G. Charlot.

Action: Said *ad hoc* committee would send its report to the Division Secretary before October 15, 1963.

(8) *Commission Reports received by the Division Secretary*

Over the period August, 1961–July, 1963, the Division Secretary had received the following reports:

(a) "*Simplified List of Terms for Use of the Analytical Chemist*"
Most comments on this report had come from the Applied Chemistry Division. The Secretary General, Dr. Morf, had sent the report, together with the comments received, to be studied by the Adhering Bodies. Their comments were expected by February 1, 1964, after which date all the comments that have been received will be studied by the Analytical Chemistry Division's Commission on Nomenclature, and where necessary worked into the report.

(b) *Fifth Report on "Reagents and reactions for qualitative inorganic analysis"*
Comments had been duly attended to and the report was now ready for printing. It would be sent to the Scientific Editor of the IUPAC journal "Pure and Applied Chemistry" for publication.

(c) "*Solubility Constants of Metal Oxides, Metal Hydroxides and Metal Hydroxide Salts in Aqueous Solution*"
This report had been published in English and German in "Pure and Applied Chemistry", 1963, *6*, No. 2, pp. 130–199.

(d) "*Tables des données spectrophotometriques d'absorption de composés utilisés pour le dosage colorimetrique des élements*"
The proofs were in the hands of Prof. G.V.M. Duyckaerts for correction. The report would eventually appear in "Pure and Applied Chemistry".

(e) "*Recommended Test Substances for the Microdetermination of Halogens and Sulfur in Organic Compounds*"
This report had appeared in "Pure and Applied Chemistry", 1962, *5*, pp. 759–761.

(f) "*Recommended Test Substances for the Microdetermination of Oxygen in Organic Compounds*"
This report had still to receive the Division Committee's approval, after which it would be sent to the Scientific Editor of IUPAC for publication.

(9) *Cooperation with Other Organizations*

IUPAC had decided to seek closer cooperation with:
—International Food and Agricultural Organization (FAO)
—World Health Organization (WHO)
—International Standardization Organization (ISO).

The two IUPAC bodies most affected by this decision would be the Applied Chemistry and Analytical Chemistry Divisions. The IUPAC Bureau had therefore asked both Divisions to draw up a plan of action.

Two joint meetings of both Divisions (on July 5 and 8, 1963) resulted in the drafting of a provisional recommendation to the IUPAC Bureau (see Appendix I),

As to the form co-operation with ISO would take, further consultation would be sought with the Secretary General, Dr. MORF, and others. [In October, 1963, a Joint Meeting between members of the ISO and the following members of the IUPAC (Prof. SCHWAB, Prof. TRUHAUT, Prof. MALISSA, Dr. BUSHILL and Dr. MORF) will be held at Paris.]

(10) *Automation in Analytical Chemistry*

Between October, 1962, and June, 1963, Prof. R. BELCHER and in particular Mr. R.W. FENELL had been busily engaged in a review of the international situation regarding automation in analytical chemistry.

A detailed report had been compiled from material provided by numerous international experts.

Mr. FENNELL gave the meeting a verbal résumé of his report. The conclusions were:

(a) International agreement was needed on the terminology used in automation.

(b) The material that had been collected gave a very clear reflection of the situation as regards automation in analytical chemistry. It was therefore worth considering whether the data might not be published in some convenient form.

The report having been officially delivered into the hands of the Division Committee, the President thanked Mr. FENNELL very much indeed for his exposé and for the considerable amount of work he had managed to produce in such a short time.

The Division Committee will consider the report to see if any action other than terminology is necessary.

The matter of terminology was referred to the Commission on Nomenclature, to which Mr. FENNELL was appointed as Titular Member.

(11) *Prefix for* 10^{-15}

Between 1959 and 1961 the Commission on Microchemistry had deliberated on the question of a prefix for 10^{-15}. A provisional proposal had been 1 Emich $= 10^{-15}$ (see minutes of 1961 Montreal Conference), but no final decision had ever been made.

The International Committee on Weights and Measures (ICWM) had meanwhile, at its meeting in 1962, adopted two new prefixes; these were:

10^{-15}; prefix: femto; symbol: f
10^{-18}; prefix: atto; symbol: a.

The meeting put forward a proposal suggesting that IUPAC too should now recommend the use of these prefixes internationally.

Prof. MALISSA's proposal to recommend capital letters for the symbols for 10 (da), 10_2 (h) and 10^3 (k), as was already the case with 10_{12} (T), 10_9 (G) and 10_6 (M), was not adopted by the meeting.

Action: The Division Secretary would ask the IUPAC Executive Committee to consider IUPAC's adopting the prefixes accepted by ICWM.

(12) *Proposal for "Trace Analysis"*

Dr. A. J. HEGEDÜS of Budapest had submitted a proposal, which briefly was as follows:

(a) Establishment of an international organization for micro-techniques and trace analysis, whose function would be every two to three years to organize an international congress or symposium (together with an exhibition of apparatus and equipment).

(b) Organization (coordination) of the literature on micro-techniques and traces analysis (including articles, abstracts and papers).

The Division Committee did not think that these matters fell within the scope of IUPAC.

Action: The Division Secretary would advise Dr. HEGEDÜS of the Analytical Chemistry Division's considered opinion.

(13) *Problems around "Physical Constants"*

A letter had been received from Prof. F. L. SCHNEIDER (USA), pointing out the difficulties due to the lack of uniformity in the way certain physical constants were recorded in the literature.

The Division thought that the problem was best referred to the Physical Chemistry Division in its Commission on Physico-chemical Data and Standards.

After due consultation, this Commission agreed to look into the difficulties mentioned by Prof. SCHNEIDER.

Action: The Division Secretary would inform Prof. SCHNEIDER accordingly.

(14) *Working-Committee on "Teaching Analytical Chemistry"*

According to information received from the Secretary General, UNESCO was interested in the way chemistry was taught in different countries. This included, of course, the teaching of analytical chemistry. To find out more about this, the Division Committee proposed to set up a working-committee that would report back to the Division Committee within two years (by January 1965).

The working-committee's terms of reference were:

(a) To give a survey of the major countries of the world on their teaching of analytical chemistry.

(b) To recommend a balanced course in analytical chemistry leading to a graduate level in several steps.

(c) To consider how to impress on the non-analytical chemist the value of analytical chemistry as a teaching medium.

(d) Whatever other recommendations the working-committee thought might be desirable.

It was proposed that Prof. L. GORDON (USA) be invited to act as chairman of this committee, it being left to him to select the other members. To help him in his choise several possible candidates were named. The size of the committee would be decided on later.

Action: The Division Secretary would inform Prof. GORDON on the matter.

(15) *Working-Committee on "The Use of Radioactivity in Analytical Chemistry and the Analysis of Nuclear Materials"*

At the request of the Executive Committee of the Analytical Chemistry Division Dr. G.B. Cook (International Atomic Energy Agency, Vienna, Austria) had submitted a proposal outlining the task of this working-committee (see Appendix II).

The Division Committee agreed to the setting-up of such a committee, expecting it to present its report—on what might be done in the radioactivity field within the framework of IUPAC—by not later than January 1965.

It was proposed that Dr. G.B. Cook should chair this committee on radioactivity. The actual size of the committee would need further consultation. Several possible candidates were named.

Action: The Division Secretary would inform Dr. Cook on the outcome of this discussion.

(16) *Review of the Reports on the Work (1961–63) and Programmes of the Six Commissions*

V.1 Commission on Analytical Reactions
V.2 Commission on Microchemical Techniques
V.3 Commission on Nomenclature
V.4 Commission on Spectrochemical and other Optical Procedures
V.5 Commission on Electrochemical Data
V.6 Commission on Equilibria Data

The Chairmen, or Secretaries, of the six Commissions gave verbal résumés of the work and future programmes of their respective Commissions.

The Division President thanked the speakers for their reports and for the work done by the individual Commissions.

The two reports, "Commission Activities 1951–1961" (December 1962) and "Status of the Work of the Six Commissions, August 1962", both compiled by Dr. P.N. Degens Jr., had given people a good idea of the activities of the Division.

Prof. I.M. Kolthoff's proposal to change the name of the "Commission on Electrochemical Data" to "Commission on Electroanalytical Chemistry" was adopted.

The proposal put forward by the Commission on Microchemical Techniques, to reassess the known and recommended primary standards, starting with the standard for neutralization reactions, met with no response. This problem is already being dealt with by the Society for Analytical Chemistry (England) at the request of our Division.

However, the item on the programme, data on "Sources of errors in microelemental analysis of difficult compounds", was approved, so that the Commission could now take up that subject. The Division Secretary unfortunately stated in the course of the meeting that approval for the item in question had already been given in April 1963. After the meeting it was pointed out that that was a mistake and the Division Secretary here wishes to offer his apologies to Dr. W. Schöniger.

That the Commission on Spectrochemical and other Optical Procedures had pruned its ambitious programme as much as it had was greatly appreciated.

The programmes of the remaining three Commissions were all approved.

Replying to a question put by the meeting about possible reorganization of the Division, the President said the matter was to be looked into more

closely. Certainly no radical changes would be introduced before 1965. Any change was sure to be made in consultation with the Commissions.

Action: The Commission Secretaries would see that the minutes of the Commission Meetings were in the Division Secretary's possession by not later than October 15, 1963. The new composition of each Commission was to be recorded in such a way as to avoid any ambiguity (giving name, initials, titles, address in full, term of office, and whether Titular or Associate Member).

(17) *Next Meetings and Division Budget 1964–65*

As far as could be seen, it would be desirable for all six Commissions, as well as the Division Committee, to meet at the IUPAC Conference in 1965.

Action: The Division Secretary would inform the Secretary General accordingly, so that the matter could be taken into account in drawing up the IUPAC budget for 1964–65.

Further, the Division Secretary told the Meeting that it was theoretically possible for Commission Secretaries to claim any expenses incurred by them in 1961–63 from the Treasurer of IUPAC. If the industries, institutes or universities where they worked were unwilling or unable to reimburse them, the secretaries should submit detailed declarations to the Division Secretary, who would see that they were dealt with in the proper manner.

(18) *Any Other Business*

(a) IUPAC Propaganda.—On a proposal put forward by Prof. R. BELCHER and Mr. A. A. SMALES, the meeting adopted the following resolution:

"With the aim of interesting a much wider body of chemists in IUPAC and its affairs, than at present, it is resolved by the Analytical Chemistry Division that a grade of corresponding member of IUPAC be created.

This grade to involve receipt by members of the Information Bulletins and possibly also of tentative recommendations for comment. To cover costs a nominal annual membership for say of £1.–.– or $3.– might be charged."

Action: The Division President would bring this resolution to the notice of the Executive Committee of IUPAC through the Secretary General.

(b) Parallel Meetings.—As before, it had again been found impossible during this Conference for a member of the Division Committee or one of the Commissions who was also a National Representative or Division President to attend all the meetings of the Council, Bureau, Division Committee or Commissions. Unfortunately the situation was probably unavoidable as far as the Division President was concerned, on account of his office. However, a member of a Division, it was thought, might make it clear to his Adhering Body that it was inadvisable for him also to act as National Representative, as this only involved him in too many jobs at once.

(c) Joint IUPAC Commission on Nomenclature.—The IUPAC Bureau had been contemplating such a commission, but had yet to come to any decision.

The meeting believed such a commission to be desirable. A representative could be assigned to it from each Division, most Divisions already having their own Commissions on Nomenclature.

If formed, a Joint IUPAC Nomenclature Commission would tackle the problem of general chemical and physico-chemical terminology common to many different disciplines.

Action: The Division Secretary would bring the matter to the attention of the Secretary General.

(19) *Adjournment*

The close of the meeting also saw an end to the terms of office of three members of the Division Committee, namely Prof. R. Belcher, Prof. G. Charlot and Prof. I.P. Alimarin.

The President said he first of all wished to express his great appreciation of the work that Prof. Belcher had done in his capacity as Vice-President of the Division from 1961–63. His co-operativeness, zest for work and knowledge of IUPAC affairs had contributed to the solution of many important problems in the Division Executive Committee. The President hoped that IUPAC might continue to make use of Prof. Belcher's services.

The President's thanks went also to Prof. Charlot, who as Vice-President (1957–61) and member (1961–63) of the Division Committee had always fulfilled his duties with such dedication and enthusiasm. A word of thanks, too, was addressed to Prof. Alimarin, who with his tact and amiable way had managed to ensure a general atmosphere of cooperation at meetings.

There being no other business, the President then closed the ninth meeting of the Analytical Chemistry Division at 4 p.m. on Tuesday July 9, 1963, wishing members a safe journey home and hoping to see them at the next meeting.

V.1 Minutes of the Meeting of the Commission on Analytical Reactions and Reagents

Place and Date: Saturday afternoon July 6, 1963, at University College, London.

President: Prof. S. Veibel (Chairman), Dr. E. Sawicki, Dr. W.I. Stephen, Mr. W.C. Johnson (Secretary).

Apologies for absence were received from Dr. M. Pesez and Prof. M. Jureček. It should be noted that the only titular members formally invited were Prof. Veibel, Dr. Sawicki, Dr. Pesez, Dr. Jureček and Mr. Johnson, since this was, in effect, a panel meeting of those more particularly concerned with the report on Organic Analytical Reactions.

(1) *The Minutes of the Previous Meetings*

in July 1961, held in Montreal, had been circulated. These minutes were approved without amendment.

(2) *Matters arising from the minutes*

There were no matters arising.

(3) *Membership*

The following Titular Members had completed their terms of office: Prof. F.J. Welcher, Mr. W.C. Johnson (Secretary).

It was agreed to nominate Prof. Welcher for a further term as an Associate Member and Mr. W.C. Johnson for a further term as Titular Member and Secretary.

Drs. J.R. Amaral and D. Goldstein had completed their terms as Associate Members and it was agreed to re-nominate them as Associate Members.

Prof. T.S. Ma and Mr. Aage Jart, who have been Observers, were also nominated as Associate Members, and Dr. W.I. Stephen, who has been an Associate Member was nominated as a Titular Member.

The membership list would then become:

Titular Members:

Prof. S. Veibel (Denmark) (President,) elected 1961; Mr. W.C. Johnson (England) (Secretary), re-nominated 1963; Prof. F. Feigl (Brazil), elected 1961; Prof. M. Jureček (Czechoslovakia), elected 1961; Prof. A.K. Mukherji (USA), elected 1961; Dr. M. Pesez (France), elected 1961; Dr. E. Sawicki (USA), elected in place of Prof. N.D. Cheronis 1962; Dr. W.I. Stephen (England) nominated 1963.

Associate Members

Dr. J.R. Amaral (Brazil), re-nominated 1963; Dr. v. Anger (Austria), elected 1961; Dr. D. Goldstein (Brazil), re-nominated 1963; Mr. A. Jart (Denmark), nominated 1963; Prof. T.S. Ma (USA), nominated 1963; Prof. F. Welcher (USA), nominated 1963.

It was realized that the Associate Membership would then exceed by two the number (4) permitted in the new draft statutes. However, it was decided to submit the above list to the Division Committee, since five of the nominated Associate Members are already engaged in the work on the Report on Organic Analytical Reactions and the draft Statutes are presumably subject to revision before final adoption.

(4) *Report on Organic Analytical Reactions*

The President reported that he had received the following bibliographic material: 1930–35 53 entries, 1936–41 126 entries, 1942–47 800 entries, 1948–53 3000 entries, 1954–60 324 entries and copies of the material covering the period 1930–1948 were distributed to the members. The Secretary was asked to send further copies to Dr. Pesez, Prof. Jureček and Prof. Ma. It was felt that the eventual survey of these rather uncritical compilations would result in a considerable curtailment, particularly of the 3000 references covering 1948–1953.

The President asked the members if, on the basis of this preliminary information, they considered the project should be pursued. In reply to a question from the Secretary it was stated that the work did not duplicate that already available in Prof. Feigl's book, since the latter dealt with the identification of individual substances, while the proposed report would deal with characterization according to functional groups and classes. It was felt that there was a real need for such a publication. U.V. fluorescence properties and reactions should be included.

The President undertook to prepare as a draft, the section of the report covering carboxylic acids and primary amines and to circulate the result of his work. This would serve an exploratory purpose and form a pattern for the rest of the Report. It was agreed that the services of other workers outside the Commission would need to be enlisted for the main task.

The desirability of including spot tests was debated and it was unanimously considered desirable that they should be covered, not in a special section, but in each monograph. It was agreed that some valuable material not found in "Feigl" could thus be provided. With this decision in view the President undertook to ask Dr. Goldstein for some material that he had offered by letter and to enquire of Drs. Amaral and Anger for their contributions. Again, the material to be included on spot tests would not deal with individual substances.

No further meetings of Commission V.1 were called during the 1963 Conference.

W.C. Johnson, Secretary

V.3 Minutes of the Meeting of the Commission on Nomenclature

Place and Date: London, July 6 and 8, 1963

Present: Prof. F. Burriel-Marti (Chairman), Dr. D. Ambrose (Secretary), Prof. I.P. Alimarin (second meeting only), Prof. E. Bayer, Prof. G. Charlot (first meeting only), Prof. L. Erdey, Prof. E.B. Sandell, Prof. R. Belcher (Chairman-Elect)

The following matters were discussed:

(1) *List of Simplified Terms for Use of the Analytical Chemist*

Since its submission to the Section Committee in Montreal, the Simplified List has been sent for comment to the Presidents of other Divisions of the Union, and has now been sent for further comment to the Adhering Bodies of IUPAC. When all comments have been received, further work will be needed on the List, and it was agreed that Mr. R.W. Fennel (England) should be invited to join the Commission to undertake this.

(2) *Recommendations on Complexing Agents in Analytical Chemistry*

The resolution of the Analytical Section has been published in Pure and Applied Chemistry.

(3) *Nomenclature and Presentation of Data in Gas Chromatography* (Project leader: D. Ambrose)

Amendments to the Preliminary Recommendations (which were published in Pure and Applied Chemistry, 1960, *1*, 177) presented by the Task Group on Gas Chromatography—D. Ambrose (England), E. Bayee (Germany), A.T. James (England), A.I.M. Keulemans (Netherlands), E. Kováts (Switzerland) and F.H. Stross (USA) were approved for publication. Details of some German words in the list of terms were settled. On a wider issue, it was agreed that no action was called for on an objection raised by Prof. E. Lange (Germany) to the use of the word chromatography. Whatever logical objection there may be against the term, it is unequivocal in meaning and is too well established for there to by any prospect of displacing it after so many years of use.

(4) *Nomenclature of Solvent Extraction* (Project leader: I.P. Alimarin)

The draft scheme drawn up by Prof. Alimarin and Dr. Yu. A. Zolotov for presentation at the Montreal Meeting has since been considered by the Commission, and Prof. Alimarin presented a third draft for discussion. After minor deletions and modifications it was agreed that this provided the basis for a definitive version in English which Prof. Sandell undertook to write. One point arising from the discussion was the distinction which needs to be made between a constant (e.g. partition constant) and a coefficient (e.g. extraction coefficient, which is dependent upon any reaction occurring as a result of the extraction process). Extraction coefficient (E) was preferred to Distribution coefficient and Recovery factor (R) to Extraction percent, the English words used in the draft. The draft is being considered by the Equilibrium Data Commission, and a general recommendation has been made that it should be expanded; further specific recommendations are awaited.

(5) *Nomenclature of Titrimetric Analysis* (Project leader: E.B. SANDELL)

General recommendations were made at the Montreal Meeting for the classification of titrimetric analysis. Detailed application of these recommendations is now required and Prof. SANDELL agreed to start this work.

(6) *International Standards Organization*

The Secretary reported receipt of a number of documents from ISO, none of which bore directly on the work of the Commission, but it was agreed that members should be informed of their titles. At the time of the meeting further documents were received from ISO/TC 47 with the request for comment on them by October 1. It was agreed that there was no possibility of the Commission being able to fulfil this request.

(7) *Future Work of the Commission*

The main goal of the Commission during the coming year will be to finish the projects already in hand. The matter of Acid-Base Primary Standards, a report on which is being prepared by the Society for Analytical Chemistry, will be dealt with by the Commission. Membership, as agreed at the meeting, is as follows:

Titular Members: Prof. R. BELCHER (Chairman) (England); Dr. D. AMBROSE (Secretary) (England); Prof. E. BAYER (Germany); Prof. I.P. ALIMARIN (USSR); Mr. R.W. FENNELL (England); Prof. E.B. SANDELL (USA).

Associate Members: Prof. W. FISCHER (Germany); Prof. H.M.N.H. IRVING (England); Dr. T.S. WEST (England).

D. AMBROSE, Secretary

V.4 Minutes of the Meeting of the Commission on Spectrochemical and Other Optical Procedures for Analysis

Place and Date: London, July 1963

Present: Dr. A.C. MENZIES, Chairman; Dr. E. LŒUILLE, Secretary; Prof. V.A. FASSEL, Dr. H. GUYER, Prof. H. KAISER (Germany), Prof. G. KORTÜM, Dr. E.W. SALPETER, Dr. B.F. SCRIBNER

Apologies were received from: Dr. L.S. BIRKS, Prof. S. MANDELSTAM and Dr. H. SVEJDA.

Meetings

The main purpose of the meetings of the Commission in London was to study the paper presented by Prof. KAISER "Terminologie und Symbole" within the framework of the Commission's programme on: "Nomenclature, Symbols and Units, with special Reference to Analytical Emission of Spectroscopy".

Prof. KAISER proposes that the Anglo-Saxon terms be studied and defined, and nationals be entrusted with the work of translating them into the idiom of the language concerned.

The paper under discussion is written in German. The meetings were held on Saturday 6 (afternoon), Monday 8 (morning and afternoon) and Tuesday 9 (afternoon).

Résumé of the discussions

The paper presented is studied in conjunction with the following articles:

(a) Suggested nomenclature in applied spectroscopy, cf. Analytical Chemistry, Vol. *24*, August 1952, p. 1349 onwards.

(b) ASTM E. 135-60T.

(c) Manual of Physico-chemical Symbols and Terminology—cf. Journal of the American Chemical Society. Vol. *82*, No. 21, November 1960, p. 5517 onwards. IUPAC article.

(d) Symboles, Unités et Nomenclature en Physique, published by IUPAC, article 9 (sun 61–44) 61.

(e) Dr. Menzies' report: "The calibration of wave length and photometric scales of photo-electric, non-recording spectrophotometers 1959."

Prof. Kaiser's report is divided into several sections:

Contents	*Discussion*
A. General	Approved
B. Comparison of the different lists of symbols	The Committee adopts a compromise with the IUPAC articles (cf. c above)
C. Definitions, symbols and units for radiation and light	Approved with the exception of point 4 which is not included
D. Photographic measurement of spectral energy	Not included
E. Standardization of the spectrochemical process of analysis	Approved after slight amendment
F. Optical data relating to spectral equipment	Approved
G. Evaluation of analytical processes and results	Approved
H. Collection of concepts which have yet to be examined	Not included

The other subjects for study by the Commission were mentioned, particulary:
Standard samples for emission spectroscopy (project leader Dr. E. Lœuille) and
Misidentifications in the M.I.T. Wave length Tables (project leader Dr. E. Lœuille)
which still await replies before the documents can be drafted.

E. Lœuille, Secretary

V.5 Minutes of the Meeting of the Commission on Electrochemical Data

Place and Date: London, July 6, 1963 (University College)

Present: Dr. Badoz-Lambling, Dr. R.G. Bates, Prof. G. Charlot, Prof. W. Kemula, Prof. I.M. Kolthoff (Chairman), Prof. G. Kortüm, Prof. R.A. Robinson (Secretary), Prof. G. Semerano, Prof. N. Tanaka, Dr. E. Vianello, Dr. P. Zuman.

Minutes

(1) Prof. Kolthoff reported on certain matters which had arisen at the Committee Meeting of the Analytical Division earlier that day. Although

these required further approval by the Bureau and could not be implemented until 1965, they would be a guide to any recommendations made by the Commission in the meantime.

(a) The group will be called the Analytical Division and not the Analytical Section.

(b) The offices of President and Secretary of a Commission can no longer be combined.

(c) A Commission consists of eight titular members (which may be increased to ten), associate members (not more than four), and observers.

(d) Ten copies of each publication by a Commission should be sent to the Secretary of the Analytical Division.

(e) A register of the membership of each Commission should be compiled.

The Meeting expressed the opinion that the title "Observer" was an unfortunate one in view of the very important contributions made by many of them and suggested that a title such as "Consultative Expert" would be more suitable.

(2) The Meeting agreed to recommend a change in title to "Commission on Electroanalytical Chemistry" as being more in accord with the work of the Commission.

(3) After hearing the report of Dr. Bates and Prof. Robinson about Dr. Perrin's compilation of dissociation constants of weak bases in aqueous solutions, it was recommended that this was very suitable for publication as an IUPAC monograph.

(4) The publication in Analytical Chemistry, *32*, 103A (1960): "Classification and Nomenclature of Electroanalytical Methods" by P. Delahay, G. Charlot and H.A. Laitinen, was recommended for republication as an IUPAC monograph, after minor modification following consultation between the three authors.

(5) Prof. Tanaka reported that his compilation of "Kinetic Parameters of Electrode Reactions" had been transferred to the Commission on Electrochemistry, Physical Chemistry Division, for discussion as to publication.

(6) It was noted that several independent compilations of half-wave potentials were in progress in different polarographic institutes and it was recommended that a committee be constitued, with Dr. Zuman as Chairman and Dr. Vianello as Secretary to correlate these activities. Further, that National Representatives from Japan and Russia be invited; Prof. T. Fujinaga and Dr. J. Stradins were unanimously suggested as these representatives.

(7) It was recommended that Dr. Zuman should pursue, by correspondence with those interested, the matter of a further compilation of pK data, and report to the next meeting.

(8) Dr. Bates reported that a paper on pH scales in water-alcohol mixtures had been read at 7 ICCC in Stockholm last year, and a further paper was about to appear in the Journal of Physical Chemistry. These should be considered in respect to assigning useful meaning to pH scales in water-alcohol mixtures. On his recommendation, it was decided to defer further discussion of the matter to the 1965 Meeting.

(9) After noting that Prof. Delahay did not wish to continue as President of the Commission, the following elections were made:

Prof. I.M. Kolthoff (President)
Prof. R.A. Robinson (Secretary)

Titular members: Dr. F. ANSON, Prof. W. KEMULA, Dr. E. VIANELLO, Dr. P. ZUMAN.

Associate members: Prof. G. CHARLOT, Prof. P. DELAHAY.

Observers: Dr. J.F. COETZEE, Dr. S. BRUCKENSTEIN.

(10) Dr. BATES, Prof. CHARLOT and Prof. TANAKA were nominated as liaison officers with the Electrochemistry Commission of the Physical Chemistry Division.

(11) A progress report was received from the Sub-Commission of Non-Aqueous Solutions. The Sub-Commission reported that they were concentrating on two subjects:

(a) Nomenclature in a relation to stability constants, formation constants, ion-pair constants, etc.

(b) The purification of solvents. A report on the purification of acetonitrile had been compiled by Dr. J.F. COETZEE and it was hoped that, before the next meeting, further reports might be made on hydrofluoric acid (Prof. CHARLOT), hydrocyanic acid and methylacetamide (Prof. KORTÜM), tetrahydrofuran (Dr. BADOZ-LAMBLING), acetic acid and ethylenediamine (Dr. BRUCKENSTEIN).

(12) A report on "Conventions for the Potentials of Reference Electrodes in Molten (or fused) Systems" was received from Dr. W.J. HAMER.

(13) The President suggested that thought be given to possible topics which came within the terms of reference of the Commission. It was agreed that the feasibility of reports on electrochemical trace analysis, potentiometric titrations, and dielectric constants were worth considering and Prof. KEMULA, Prof. CHARLOT and Prof. ROBINSON, respectively, were asked to consider these topics and report to the next meeting.

(14) The meeting expressed strong concern lest the draft statutes be adopted without consultation with the Commissions and instructed the Secretary to convey to the Section Committee their hope that copies of the draft statutes could be circulated for comments.

R.A. ROBINSON, Secretary

V.6 Minutes of the Meeting of the Commission on Equilibrium Data

Place and Date: London, July 5–7, 1963

Present: Titular Members: Prof. D.N. HUME (Chairman), Dr. J.C. HINDMAN, Prof. A.E. MARTELL, Prof. H. FREISER, Prof. J. BJERRUM.

Associate Member: Prof. I. LEDEN

Unofficial observer: Prof. FUJIWARA (representing Prof. T. TAKAHASHI who was unable to come to London)

(1) *Tables of Stability Constants,* second edition

Prof. MARTELL reported from his meeting with Dr. CAHN that the latter now has all the manuscript. The Inorganic Division is mostly through galley proof, and the Organic is partially set up. Changes need to be made in the organic references and some of the text is still to be set. The new edition will be in one volume and will be about three times the size of the combined volumes of the first edition. Dr. CAHN estimates that the new edition will be

published, at the earliest, by Christmas of 1963 and may be as late as Easter 1964.

(2) *Future Policy on Equilibrium Data*

There was a long discussion, supplemented with quotations from letters by Prof. SILLÉN. The questions considered were

(a) whether or not the work on stability constants should be continued and

(b) if so, should complete new editions or supplementary editions of some sort be issued.

The unanimous feeling of the Commission was that the work should continue, and that future revisions of Stability Constants were very worth while. It was felt that the Commission was the logical body to oversee this work supplying as it does an international representation of opinions, a pool of knowledge and experience not existing elsewhere, and a responsible body to provide continuity and ensure replacements being available for the most active workers when they feel that they can no longer participate.

The form of future revisions was discussed, and the various possibilities considered were as follows:

(a) New revised editions after the style of the present one. There is a growing feeling that the magnitude of the task involved and the growing volume of literature will make this impractical.

(b) Revised editions made up with the aid of a computerized automatic typing system, such as the Flexowriter, which can take piecemeal data, organize it, and print it ready for photo offset.

(c) The issuance of periodical supplements.

(d) The issuance of an annual supplement.

(e) A revision service to provide new data on loose sheets for a loose leaf type of binding, or a paste-on re-editing.

Annual supplements or a revision service would probably involve too much work be practical. It was agreed that Prof. SILLÉN and MARTELL should continue to gather data as it appears in the current literature, and this they have already expressed willingness to do. In two years the Commission should evaluate the situation and make a decision as to how future revisions should be made. Presumably work on the next revision would start thereafter.

Preparatory to the 1965 meeting, methods of automatic collation and typing should be explored more thoroughly. An *ad hoc* working-group consisting of Dr. HINDMAN and Prof. SILLÉN was therefore appointed to explore and report in 1965 as to the feasibility of this technique. Dr. HINDMAN is to be the responsible head of this group.

(3) *Solvent Extraction Project*

Prof. DYRSSEN has been gathering data on the solvent extraction characteristics of complexes with selected ligands, principally TTA, beta isopropylpropolone, dithiazone, oxine, dimethylglyoxime, and dioctylphosphate. This work is well along. Prof. FREISER has started to gather solvent extraction data in connection with the work he is doing on the revision of his book. The Commission discussed the appropriate scope of the project and it was decided that it should be limited to the extraction behaviour of metals and inorganic constituents such as boron, phosphorus, etc., which involve complex equilibria. It was felt not to be within the scope of the study to include distribution data for organic systems not connected with the extraction of inorganic constituents. It was felt that the project should interest itself in distribution data for both complexes and the ligands, in other words, all pertinent information concerning the extraction equilibria of analytical interest. It should not be limited to chelate systems. Stability constants

connected with the extraction and distribution equilibria should be included, if derivable.

To the already existing working committee (Prof. FREISER, chairman, and Prof. DYRSSEN) the addition of Dr. Y. MARCUS was proposed. Dr. MARCUS has subsequently expressed his willingness to participate.

It was agreed that the working committee should have as its objective to gather the major part of the data and do most of the work in the next two years. The Commission as a whole should then criticize and evaluate the status of the work in 1965 with the aim of having it ready for publication as an article or set of tables (whichever develops as being the most appropriate) in *Pure and Applied Chemistry* three years from now.

It was also agreed that an early attack on problems of nomenclature, symbols and format should be made in order that the work of the three members might proceed as smoothly as possible and the final results be presented with a minimum of revision and a maximum of clarity and usefulness to the ultimate reader. This raised the general question of nomenclature which was then considered by the Commission in a context broader then that of the solvent extraction project.

(4) *Standardization of Nomenclature and Symbolism*

It was agreed that to assist in achieving international agreement in matters of nomenclature and symbolism in the area of the Commission's activity is also a Commission responsibility. A Commission which publicizes an authoritative and widely accepted report is acting, consciously or unconsciously, to standardize international usage in the terminology which it has adopted. It has become evident that the wide-spread acceptance of the first edition of Stability Constants has resulted in a *de facto* standardization of usage in the terminology and symbols of stability constant work since 1958, when the first edition appeared.

The Commission agreed to the appointment of an *ad hoc* sub-committee under the chairmanship of Prof. SILLÉN with Prof. MARTELL and DYRSSEN as members to formulate a specific proposal to be made to the Division Committee for official IUPAC recommendation of the terms standardized in the two editions of Stability Constants. The cooperation of the Commission on Nomenclature will be solicited. The *ad hoc* committee should formulate a draft for circulation to the members of this Commission within one year in order that the revised draft be ready for the Division Committee at its 1965 meeting.

The Commission decided on the immediate appointment of an *ad hoc* committee consisting of DYRSSEN as chairman and FREISER and IRVING as members to study problems involved in the expression of distribution data, specifically with application to liquid-liquid extraction involving an aqueous phase, but with due regard to be given to the general problem of expressing distribution between different liquid phases. Progress is required in this area for immediate practical application in the work of the sub-committee on solvent extraction. Proposals are to be formulated and evaluated as soon as possible, and the co-operation of the Commission on Nomenclature solicited.

A summary of Prof. ALIMARIN's report on suggestions for symbols and terminology in solvent extraction (prepared under the auspices of the Commission on Nomenclature) was given by Prof. FREISER, and the report discussed by the members of this Commission. It was the feeling of the members of the Commission that some of the definitions might be improved, and that the very best choices among available symbols and terms may not have been made. The consensus of opinion was that the subject of terminology in

solvent extraction needed further study, and the recommendation was made that the Division Committee should not accept the report of the Commission on Nomenclature until time was allowed for further study and our own sub-committee could make recommendations. The sub-committee of three (FREISER, DYRSSEN and IRVING) should give detailed consideration to the ALIMARIN report and prepare appropriate recommendations.

(5) *Nomenclature in Analytical Separation Processes*

It became evident in the discussion of solvent extraction nomenclature that this was simply one phase of a more general nomenclature problem involving all types of analytical separations. There is need for international agreement on terms in the whole field of separations, and these terms should be made as compatible as possible. At present the same basic concept is often described in different terms and symbols when applied to different separation processes, even though these may be fundamentally very similar. The necessity of dealing both with single-stage and multi-stage distribution processes must be kept in mind and any good system of nomenclature should be applicable to both.

It was pointed out in the discussion that besides solvent extraction, the processes of distillation, ion exchange, gas-solid chromatography, gas-liquid chromatography, liquid-solid chromatography, liquid-liquid chromatography, dialysis, thermal diffusion, gaseous diffusion, electro-diolysis, electrophoresis, electrodeposition, adsorption, and flotation were processes bearing certain fundamental similarities, and that insofar as is practicable a single unified system of nomenclature and symbolism to apply to all of them would be most desirable. At a minimum, contradiction in terms and incompatability of definitions should be, by international agreement, eliminated from the nomenclature of similar and closely related separation processes. It was conceded that consideration of this matter suggested a long range nomenclature study which was far beyond the scope of this Commission. It was decided, therefore, that the Commission should suggest to the Division Committee that it plan for long range study under an appropriate organizational structure.

From the experience of this Commission it seems there is very great advantage in having nomenclature and terminology problems considered primarily by groups which are actively at work on studies of the methods involved, and who are engaged in the collection and critical comparison of data in the fields. It was therefore suggested that the Division Committee consider an alternative approach to many questions of nomenclature and terminology, namely, that the primary work be done by the Commissions deal directly with the data and that the Commission on Nomenclature serve as a correlating and coordinating group, having on its membership representatives of the several other Commissions. (This proposal was made in the chairman's oral report to the Division Committee.)

(6) *Suggestions for Reorganization of the Analytical Division*

The functions of the Analytical Division and its several Commissions were discussed, and the feeling was expressed that a reappraisal of the work of all the commissions might be appropriate in the near future. The feeling was expressed quite emphatically by the members of this Commission, both by those present and those who had written to express their views, that the work of the Commission on Equilibrium Data was useful, significant, and should be continued. It was further agreed that reorganization of the Analytical Division should be done only after careful thought and study. The

possibility and advantages of cooperation and collaboration between the several Commissions (as in the case of Nomenclature discussed already) should be explored.

(7) *Membership*

The problems involved as a result of the recent action to limit the number of associate members were discussed. This Commission has used the associate members status to keep individuals who had served as titular members available and active in the functioning of the group. The nature of the Commission's work has been such that its activities have been long range and continuing, rather than short range and limited. The new category of member described in the statutes as "Observer" is satisfactory in principle, but the name is felt to be most unfortunate, and the recommendation was made that the Division Committee support any movement to replace the term with another which would not carry the same unfortunate implications. Prof. ARTHUR MARTELL was unanimously elected Chairman for the period 1963 to 1965 and Prof. JANNIK BJERRUM Secretary for the same period. Dr. Y. MARCUS of the Israel Atomic Energy Commission and Prof. G. SCHWARZENBACH of the ETH were voted as the Commission's choice for new titular members for the period 1963–1967. It was agreed that if the Division is to operate under its old rules, Prof. D.N. HUME and Dr. J.D. HINDMAN should be elected associate members for a four-year term each, starting 1963. If the old statutes are not to continue, these men should be appointed to the appropriate type of membership which would allow them to continue their association with the Commission. If six associate members are to be allowable, Prof. HUME would be an associate member and Dr. HINDMAN an Observer. If the number of associate members is to be drastically limited, both should be appointed as "Observers". The suggestion was made that some provision should always be afforded for the immediate past chairman and secretary to remain active members of the Commission, either in titular or associate status, to help provide continuity and promote the smooth working of the Commission's activities.

Subsequent to the meeting, both Dr. MARCUS and Prof. SCHWARZENBACH agreed verbally to serve on the Commission and assist in its activities.

DAVID N. HUME,
Chairman and Secretary

APPENDIX I

Recommendation to IUPAC-Bureau: Liaison with FAO/WHO

The scientific and technological programs of the WHO and FAO, and in particular their recent assumption of responsibility for the Codex Alimentarius project, often require the referral of chemical matters for review and recommendations by specialists in these areas. Since it is the desire of IUPAC to cooperate with these international agencies when consulted on chemical questions, it is proposed, after due consideration of its capabilities and of the responsibilities involved, that IUPAC create an *ad hoc* Committee for Liaison with FAO and WHO, to be composed of the following members:

The President of the Applied Chemistry Division.
The Chairman of the Food Section of the Applied Chemistry Division.
The Chairman of the Pesticides Section of the Applied Chemistry Division.
The Chairman of the Oils and Fats Section of the Applied Chemistry Division.
The President of the Analytical Chemistry Division.

The Chairman of the Liaison Committee should be the President of the Applied Chemistry Division.

It shall be the purpose of this Liaison Committee

(a) To receive from FAO, WHO, or the Codex Alimentarius requests for opinions or advice of qualified specialists relative to chemical problems in the areas listed below.

(b) To decide whether the consideration of these problems falls within the scope and capabilities of any of the existing Divisions, Sections or Commissions of IUPAC, or of any *ad hoc* Commission which may be formed for such purpose.

(c) To seek appropriate authority and financial support for the assignment of these problems.

(d) To expedite the consideration of the problems and the submission of a final report of the recommendations of the IUPAC group, to the original requesting agency.

Chemical questions which might appropriately be referred to IUPAC may be within the following areas:

(1) Nomenclature of chemical substances including common names to replace complex chemical terminology.

(2) Definitions and specifications for the identity, purity, and quality of chemical substances.

(3) Analytical procedures for the determination of the conformity to definitions and specifications of chemical substances.

(4) Analytical procedures for the determination of the *presence*, qualitatively and quantitatively, of such substances in feeds, foods, or their ingredients.

It would be understood that matters relating directly to the definitions and standards for foods, or to problems of public health, shall not be referable to IUPAC except insofar as they may be of a strictly chemical nature and fall within one of the categories listed above.

APPENDIX II

The Use of Radioactivity in Analytical Chemistry and the Analysis of Nuclear Materials

I. *Establishment of a Working Committee*

According to the resolution of the Executive Committee of IUPAC taken in Basle on April 4, 1963, and after discussion with the President of the Joint Commission of Applied Radioactivity, Dr. H. SELIGMAN, the following persons have been invited by Prof. H. MALISSA, President, Analytical Chemistry Division, IUPAC, to integrate a working committee and have accepted:

G.B. COOK, International Atomic Energy Agency, Kärntnerring Vienna, Austria (Chairman)

J. MINCZEWSKI, Instytut Badán Jadrowych Dorodna 16, Warsaw 9, Poland (Secretary)

M.B. CRESPI, Comisión Nacional de Energía Atómica, Avenida del Libertador 8250, Buenos Aires, Argentina

II. *Scope of the Work*

The working committee will be concerned with the application of radioactivity in the analytical chemistry field and with the analysis of nuclear materials themselves. Under the first item its activities will cover activation analysis and tracer applications such as radioisotope dilution analysis and use of radioactive reagents. The second item covers mainly the analysis of uranium and thorium and its ores and compounds and eventually of other materials which are of sufficient use in the nuclear field to be considered nuclear materials. This includes graphite, beryllium, heavy water and reactor structural materials of low total cross-section. The activity of the working committee in the latter fields should be restricted to cases where important problems of a specific nuclear interest exist to avoid superposition with other commissions. It was also clear from the discussion with the President of the Joint Commission of Applied Radioactivity that duplication of work with this Commission will not occur.

III. *Relations with the IAEA Laboratory*

The working committee will be in close contact with the laboratory of the IAEA which is implementing a programme on intercomparison of analytical methods currently applied to nuclear materials aiming at the establishment of recommended techniques. This contact is desirable to avoid duplication of work and is secured at present by the fact that the Chairman of the Committee is the Head of the IAEA laboratory. To implement this coordination, the Chairman of the working committee will keep the Committee informed on the work of the IAEA laboratory in the analytical field, and the Committee in turn may recommend to the IUPAC that meetings or programmes of work originated at the IAEA laboratory be considered as joint work and cosponsored by both organisms. It may also suggest to the Agency the implementation of laboratory or coordinative work not initially planned by the IAEA laboratory but considered convenient by IUPAC for the purposes sought.

IV. *Specific Fields of Action*

At the present time the working committee considers the following subjects to be appropriate for its activities. Further suggestions will be welcome.

(1) Activation Analysis and Tracer Techniques in Analytical Chemistry.

(a) Problems of nomenclature.

The Committee should sponsor an assessment of the use of radioactivity terms in analytical chemistry and issue recommendations on their use.

(b) Radiochemical purity of reagents.

The Committee should study and recommend the specifications to be met by reagents from the point of view of their applicability in radioanalytical work. The concept of radiochemical purity should be examined and carefully defined in chemical terms for important cases. Studies should be sponsored, for instance, on the specification of reagents used as standards in activation analysis, on the purity of materials used in containers for irradiation and on the specifications of the water used to prepare solutions to be irradiated.

(c) Sponsoring of critical reports on specific subjects such as mentioned under (b). Eventually, compilation of tables of interest to analytical chemists using radioactivity in their work.

(d) Specifications for artificially radioactive chemicals including radiolytic decomposition properties.

(2) Analysis of Nuclear Materials

(a) Advice on the work sponsored by the IAEA laboratory on international comparisons of analytical techniques currently applied in the assay of nuclear materials and in their impurity analysis.

(b) Issue of critical reports and recommendations on analytical procedures.

(c) Examination of the present state of the definition of "nuclear pure" materials with the aim of establishing specifications and recommending the adoption of analytical standards when this appears desirable.

(3) Study of the possibility of establishing primary analytical standards for uranium and thorium.

(4) Recommendations on safe handling of radioactive substances in analytical work.

PROGRAMM OF THE COMMISSIONS 1963–1965

(Mainly compiled from the minutes of the IUPAC London Conference 1963)

V.1 Commission on Analytical Reactions and Reagents

(1) *Publications*

The manuscript of the (fifth) report on: "Reagents and Reactions for Qualitative Inorganic Analysis", Editor P. W. West, was sent to the Editorial Board of the IUPAC by the Division Secretary in August 1963. The proofs will be corrected by Prof. P. W. West.

The report will be published as a book under the auspices of the IUPAC Journal "Pure and Applied Chemistry".

(2) *Organic Analytical Reactions*

In the period of 1961–1963 bibliographic material was collected which resulted in more than 4000 references over the period of 1930–1960. These references deal with the characterization of functional groups and classes. UV fluorescence properties and reactions will also be included.

The material has not yet been critically selected. Prof. S. Veibel has therefore undertaken to make a critical draft covering carboxylic acids and primary amines. This draft will enable the Commission to decide whether continuation of the work is of international importance.

Note: The Division Committee should appreciate it if this draft would be received before, or on, March 1, 1964. A decision as to continuation of the work could then, perhaps, be taken before June 1, 1964.

V.2 Commission on Microchemical Techniques

(1) *Recommendations on Test Compounds for Micro-elemental Analysis*

Recommendations on test compounds for the following determinations have been finished: carbon/hydrogen, nitrogen, halogen, sulfur and oxygen determinations.

Following recommendations will relate to test compounds containing respectively the element phosphorus, arsenic or mercury. After that a list will be drawn up giving test compounds for the determination of a number of specified functional groups.

(2) *Definitions of Micro- and Trace Analysis*

The Commission will try to have a draft for these definitions completed per July 31, 1964 (project leader Dr. W. Schöniger).

(3) *Data on "Sources of errors in micro-elemental analysis of difficult compounds"*

Work on this subject will now be taken in hand. To this end in the first place a programme will be drawn up and announced in various analytical journals. Laboratories should be invited to report on the difficulties which they have encountered in the elemental analysis of difficult organic (metallo-organic) compounds. Dr. R. Levy has been appointed project leader. It is estimated that the project will require approximately four years (1963–1967).

(4) *Accuracy of Carbon/Hydrogen Determination*

The first part of the work on this subject has proceeded to an advanced stage, so that a report on the results obtained may be expected to be completed in July 1964 (project leader: Dr. M. Věčěra). On the basis of this report it will be decided whether it will make sense to proceed with the work in question, considering that recently completely new routes for the C/H determination have been published.

V.3 Commission on Nomenclature

(1) *List of Simplified Terms for Use of the Analytical Chemist*

This report was sent to the Adhering Bodies of the IUPAC for comment. All comments should be in possession of the Division Secretary before February 1, 1964; he will pass them on to the Commission on Nomenclature.

Many comments have already been received and further work on the List will be needed. It is expected that the revision of the English text will be ready at the time of the 1965 Conference. Subsequently, the French, German and Spanish texts can, if necessary, be revised with reference to the English text. (Project leader: Mr. R.W. Fennell.)

(2) *Nomenclature and Presentation of Data in Gas Chromatography*

Amendments to the Preliminary Recommendations were approved for publication. These amendmends will be incorporated in a new report.

Early in 1964 the report can be submitted to the Editorial Board of the IUPAC for publication. (Project leader: Dr. D. Ambrose.)

(3) *Nomenclature of Solvent Extraction*

The 3rd draft of this report (made by Prof. I.P. Alimarin) has been sent to our Commission on Equilibrium Data to be studied. The subject matter being very complicated it cannot be expected that a final report will be ready at the time of the 1965 Conference. (Project leader: Prof. I.P. Alimarin.)

(4) *Nomenclature of Titrimetric Analysis*

The general recommendations for the classification of titrimetric analysis given in Montreal (1961) have to be extended. Prof. E.B. Sandell will make a draft report.

(5) *Automation in Analytical Chemistry*

The report written by Mr. R.W. Fennell presents a good survey of the present state of affairs in Europe and the USA. After having studied the report the Division Committee has come to the conclusion that for the time being no further work is required within the scope of IUPAC activities, except drawing up precise definitions of certain concepts. These concepts are: automation, semi-automation, mechanization, and instrumentation.

(6) *Acid-Base Primary Standards*

This subject is still in the hands of the Society for Analytical Chemistry (England). As soon as their report has officially been submitted to the Analytical Chemistry Division and has been studied, any further actions for IUPAC can be decided upon.

(7) *Methods of Expressing Concentrations in Analytical Chemistry*

This subject can, for the time being, be dropped, because more important subjects are waiting to be finalized.

V.4 Commission on Spectrochemical and Other Optical Procedures for Analysis

(1) *Nomenclature, Symbols and Units with Special Reference to Analytical Emission Spectroscopy*

Prof. KAISER has drawn up a draft proposal in the German language, viz. "Terminologie und Symbole". After a few modifications this draft was approved at the London Conference 1963.

Members of the Commission will translate the German text into English and French. Subsequently the text in three languages will be presented to the Physical Chemistry Division for comment. The aim is to have the report ready for publication in "Pure and Applied Chemistry", in 1965.

(2) *Commercial Standard Samples for Emission Spectroscopy*

The Commission are still waiting for some data. After these have been received Dr. E. LŒUILLE will draw up a report. It is expected that this report will be ready for publication in 1965.

(3) *Misidentifications in the MIT Wavelength Tables*

In Montreal (1961) it was decided to explore the feasibility of compiling a critical collection of misidentifications. With a view to a new edition of these MIT tables by HARRISON, Dr. E. LŒUILLE has been given the task of collecting the observations and suggestions arising from the use of the tables in actual practice. Dr. LŒUILLE has already received a great number of letters and is awaiting still more comments. It is intended to set a dead line, after which the comments will be combined into a report. The report should be ready for discussion during the Paris Conference 1965.

(4) *Spectrophotometry*

The report: "Tables des données spectrophotométriques d'absorption de composés utilisés pour le dosage colorimétrique des éléments" by G. V. M. DUYCKAERTS and co-workers is now at the printer's. The proof has been completed and is being now checked by Prof. DUYCKAERTS.

Pro memoria

A. *Calibration methods and calibration values in emission spectroscopy.*—The members of the Commission have not so far had an opportunity to comment on the two reports by Prof. H. KAISER concerning:

(a) A critical study of calibration methods independent of the analysis of pure chemical means.

(b) A correlation study of calibration values in spectral analysis.

For the time being no work will be done on this subject, because of the priority given to item 1.

B. *Standardization of methods of reporting fluorescence emission spectra.*—A relevant proposal was put forward in Montreal (see minutes of the 8th Meeting of the Anal. Chem. Div., August 1961, Montreal).

In connection with more urgent work this item has been shelved for the time being.

(1) *Dissociation Constants of Organic Bases in Aqueous Solutions*

At the time of the London Conference the report drafted by Dr. D. D. PERRIN was approved by the Commission and sent to the Division Secretary. It is the intention to publish the report as a book under the auspices of the IUPAC Journal "Pure and Applied Chemistry".

(2) *Classification and Nomenclature of Electroanalytical Methods*

The article published in Analytical Chemistry *32* (1960) 103 A will be re-written, after which it will be submitted as a IUPAC Recommendation to the IUPAC Editorial Board for publication in "Pure and Applied Chemistry" (Project leader: Prof. P. DELAHAY).

(3) *Nomenclature and Standardization of pH-Measurements*

Dr. R.G. BATES (National Bureau of Standards, USA) has, in the period of 1961–1963, been actively engaged on this subject (lectures, publications). At his request the Commission will not take action in the period of 1963–1965. At the 1965 IUPAC Conference it will be ascertained what steps can be taken within the scope of IUPAC activities.

(4) *Compilation of pK Data*

Dr. P. ZUMAN will, together with other interested scientists, ascertain whether it is desirable to continue the compilation of pK data and will report in 1965.

(5) *Compilation of Half-Wave Potentials in Polarography*

It was noted that several independent compilations of half-wave potentials were in progress in different polarographic institutes.

It will be attempted to coordinate these activities within the IUPAC. The results will be reported in 1965. (Project leader: Dr. P. ZUMAN.)

(6) *Electrochemical Data in Non-aqueous Solutions*

Attention is given to two aspects, viz.:

(a) Nomenclature in relation to stability constants, formation constants, ion-pair constants, etc.

(b) The purification of solvents (acetonitrile, hydrofluoric acid, hydrocyanic acid, methylacetamide, tetrahydrofuran, acetic acid and ethylenediamine. (Co-workers: Mrs. Dr. J. BADOZ-LAMBLING, Dr. S. BRÜCKENSTEIN, Prof. G. CHARLOT, Dr. J.F. COETZEE and Prof. G. KORTÜM.)

(7) *Potentials of Reference Electrodes in Molten (or Fused) Systems*

A report on this subject was received from Dr. W.J. HAMER. After it has been studied the direction to be pursued for further investigation will be decided upon. (Co-workers: Prof. G. CHARLOT, Dr. S.N. HEUGAS, Dr. G.J. HILLS and Prof. H.A. LAITINEN.)

V.6 Commission on Equilibrium Data

(1) *Project on stability constants*

(a) *Tables on stability constants.* The manuscript of the 2nd edition of the "Tables on stability constants" is in the press (both the inorganic and the organic part).

The new edition will be in one volume and will be about three times the size of the combined volumes of the first edition. The edition is expected to be ready early in 1964.

(b) *Future revisions of the Tables.* Prof. SILLÉN and MARTELL are willing to continue collecting data as they appear in current literature.

In 1965 it will be decided in what way the tables of stability constants should be revised and completed.

Methods of automatic collation and typing of data should be explored more thoroughly. Dr. HINDMAN and Prof. SILLÉN will report on their findings in 1965.

(c) *Standardized terminology.* It has become evident that the wide-spread acceptance of the first edition (1958) of the "Tables on stability constants" has resulted in a *de facto* standardization of usage in the terminology and symbols of stability constant work.

An *ad hoc* sub-committee (Prof. SILLÉN, MARTELL and DYRSSEN) was set to formulate IUPAC recommendations for the relative terminology. The draft recommendations will be sent to the Commission members in 1964.

The cooperation of the Commission on Nomenclature will be solicited.

(2) *Solvent Extraction Project*

(a) *Collection of solvent extraction data.* Prof. DYRSSEN and FREISER have already collected solvent extraction data and Dr. MARCUS will now co-operate. It has been decided that the project will be restricted to the extraction behaviour of metals and inorganic constituents which involve complex equilibria of analytical interest. It should not be restricted to chelate systems. Stability constants connected with the extraction and distribution equilibria should be included if they can be derived.

It will be tried to have the manuscript of the set of tables ready in 1966.

(b) *Terminology in solvent extraction.* A proposal concerning the nomenclature, symbols and format relating to the solvent extraction project will be submitted as soon as possible by an *ad hoc* committee constituted by Prof. DYRSSEN (Chairman), FREISER and IRVING, in co-operation with the Commission on Nomenclature.

In this connection Prof. ALIMARIN's report will also be studied critically.

(3) *Nomenclature in Analytical Chemistry*

It is the opinion of the Commission on Equilibrium Data that there is a need for international agreement on terms *in the entire field* of analytical separations (chromatography, solvent extraction, thermal diffusion, flotation, etc. etc.) and that these terms should be made as much compatible as possible.

Consideration of this matter suggested a long-range nomenclature study. The Analytical Chemistry Division Committee is asked to draw up a plan under an appropriate organizational structure.

In this connection the Division Committee is also asked to study thoroughly the entire organization concerning the study of nomenclature, symbols and terminology problems in the Analytical Chemistry Division in order to arrive at a better coordination.

VI. APPLIED CHEMISTRY DIVISION

(previously known as the Applied Chemistry Section)

REPORT ON ACTIVITY

1961–63

As you may know there is a likelihood that the Union, subject to the agreement of Council in July, 1963, may change the title of all present "Sections" to "Divisions". Already this change is being accepted by many as an accomplished fact thereby causing some confusion. This is most likely in the Applied Chemistry Section as the term "Division" has for 12 years been applied to smaller units of that Section. In the event of this change of title being confirmed some other term will need to be chosen for the present Divisions of the Applied Chemistry Section.

In this report the original terminology for the Applied Chemistry Section and its constituent parts is used.

Section Committee (Membership)

The new structure of the Applied Chemistry Section, agreed by the Council of the Union in August 1961 (see C.R. XXIst Conference, pp. 178, 179), has several new features, one of which is the facility to improve geographical representation on the Section Committee by appointing additional titular members. The Section Committee decided to elect four additional members for that purpose and (as indicated in the interim report, 1962) after consideration of the countries represented by its present members, decided that an additional member from each of the following countries would be appropriate: Germany, USSR, Sweden and Switzerland. Dr. Sturm (Switzerland) had meanwhile been appointed a member of the Executive Committee of the Section so a request for a nomination was made through the Secretary-General to the three Adhering Bodies representing the remaining three countries. The following gentlemen were accordingly nominated and duly appointed as titular members of the Applied Chemistry Section Committee: Prof. F. Patat (Germany); Prof. N. N. Woroschozow (USSR); Dr. C.O. Gabrielson (Sweden).

The new structure of the Applied Chemistry Section also provides for better representation of International Associations. This has enabled a representative of the International Commission for Uniform Methods of Sugar Analysis (ICUMSA) to be appointed to the Section. Representatives of other such organizations are anticipated in the future.

The Section Committee, in accordance with the current Statutes and By-Laws, deemed it wise to elect a second Vice-President of the Section. As a consequence, in addition to Prof. Truhaut, the Section now has Dr. W. Gallay as a Vice-President.

I, as present President of the Section, retire this year, having completed the statutory four years in that office, and therefore a new President will be elected, to assume his duties at the termination of the July Conference of the Union. If this is a suitable place I would like to record my great appreciation of the support I have received from all members of the Applied Chemistry Section during the time I have served as Secretary and later as President.

The following two items, although they may be considered to fall within the sphere of activity of Divisions, are the subject of action at a higher level (Bureau) and consequently are reported separately.

Information Bureau on Dangerous Substances

The possibility that the Union might take a hand in the initiation of such a service was first raised by Dr. A. L. G. Rees (Australia). The matter was considered by the Toxicology and Industrial Hygiene Division, the Applied Chemistry Section Committee and the Bureau of the Union. The general view was that such an Information Bureau would require considerable financial backing if it were to be really effective. It was pointed out that some of the ground is already covered by other organizations and therefore it would be an obvious advantage for the Bureau to be run with the collaboration of those organizations, e.g. WHO, FAO and possibly ILO.

In any case it was clear that one should first assess the need for such a Bureau and if possible obtain some indication of the level of support which might be expected from national, governmental and industrial sources. To that end the Bureau of the Union decided to seek such information through the various Adhering Bodies. It is expected that the results of that enquiry will shortly be reported by the Secretary General.

International Food Standards

A joint FAO/WHO Conference on Food Standards was held in October, 1962, at which 44 countries and 24 international organizations were represented (including IUPAC). The Conference proposed that a Commission be appointed to form a Codex Alimentarius, (a) to unify Food Standards throughout the world, (b) to safeguard health and (c) to assist international food trade.

As such a Codex must include agreed methods of analysis it is intended that due consideration should be given to analytical methods and standards already adopted by various international organizations concerned with food products. Such organizations include Divisions of the Applied Chemistry Section of IUPAC. The Divisions most concerned in this matter are the Pesticides Division, the Toxicology and Industrial Hygiene Division, the Oils and Fats Division and of course the Food Division. Apart from methods of analysis it is to be expected that IUPAC may be called upon for authoritative advice on a variety of chemical matters (e.g. nomenclature of food additives).

If the Union intends to collaborate fully with other world organizations in this matter of the Codex Alimentarius it would seem that much of the burden may fall on the Applied Chemistry Section. In that event serious thought will need to be given to devising a suitable mechanism by which the necessary information may be obtained and transmitted.

VI.1 Food Division

The Division Committee met twice in London (November, 1960, and September, 1962) while the Trace Elements in Food Commission held its meeting in Paris in March, 1962, to consider its reports. The finalized text on lead determination was approved and the report forwarded for publication by IUPAC. A report on the determination of mercury in food has been drafted and is expected to be ready for publication before July, 1963, when the Commission will have completed its work. It has been agreed by the Bureau that a new Trace Elements in Food Commission will then be formed to study the determination of selenium, fluorine and boron.

The Food Additives Commission is at present actively engaged in collecting from member countries information on specifications and analytical

methods for the main food additives. It is hoped that some of this information will be available for consideration and comment, at the next meeting of the Commission.

The Division Committee has under consideration the desirability of studying the control of the quality of smoke used for the curing of food products.

VI.2 Fermentation Industries Division

VI.2.1 Commission on Determination of Fusel Oils

The Commission met in London in September, 1962, and held a successful open meeting at which members described the results of their work to date. A draft report has been prepared which will be finalized in time for the July meeting in London. The Sections of this report will contain:

(a) definition of substances to be determined (alcohols, aldehydes, ketones, etc.) and the specific methods for determining each category;
(b) determination of minute quantities of the substances present in large amounts of water;
(c) choice of columns and temperatures for chromatographic analyses;
(d) determination of carbonyl compounds;
(e) quantitative estimation of the chromatograms;
(f) variation of fusel oil composition with conditions of fermentation, and
(g) pathways of formation of the higher alcohols.

VI.3 Division des Matières grasses

La Division s'est réunie à Londres en octobre 1961 et à Prague en juillet 1962. Elle s'est réunie avec l'IUPAC à Londres les 6 et 8 juillet 1963.

Le travail collaboratif avec d'autres groupements internationaux intéressés à nos travaux, soit plusieurs comités techniques de l'ISO (International Standards Organization), l'AIS (Association internationale de la Savonnerie), le CID (Comité international de la Détergence) et l'IASC (International Association of Seed Crushers), ainsi que l'Association internationale des Chocolatiers, a été continué. L'échange de documents avec la Division des Revêtements de Surface de l'IUPAC s'est accru.

Malgré de grosses difficultés pratiques et techniques, une nouvelle édition (la 5[e]) des méthodes normalisées par la Division verra enfin le jour; éditée par Butterworths, elle devrait, sauf imprévu, sortir de presse en septembre 1963. Elle paraîtra sous forme de feuillets amovibles, de manière à pouvoir régulièrement faire paraître des suppléments ou modifications éventuelles. Les questions suivantes ont finalement trouvé une solution et ont été normalisées:

Dosage de faibles quantités d'eau dans les huiles
Indice de benzidine
Dosage des α monoglycérides
Dosage du glycérol dans les savons
Détermination spectrophotométrique de la couleur des huiles

Les questions suivantes, après étude préliminaire, ont provisoirement été abandonnées:

Dosage spectrophotométrique UV, et
Dosage par chromatographie en phase gazeuse des acides polyinsaturés

Les questions suivantes sont actuellement en cours d'étude:

Indice Bömer

"Foots in linseed oil"
Courbe de solidification des graisses
Chromatographie en phase gazeuse (sur composition connue et applications sur 2 huiles simples + saindoux)
Echantillonnage des savons
Alcali caustique libre dans les savons
Dosage de l'insaponifié et de l'insaponifiable dans les savons (2 méthodes)
Dosage du K et du Na dans les savons
Détermination potentiométrique des Indices d'acide, de saponification et d'hydroxyle pour les milieux très colorés

Les questions suivantes seront abordées ou revues sous peu:
Indice de peroxyde
Nouvelle proposition pour la courbe de solidification
"Slippoint"
Analyse différentielle thermique

VI.4 Water, Sewage and Industrial Wastes Division

The Committee of this Division met once during the period under review, in Paris on 6 December, 1961.

At this meeting it was decided to propose a short symposium of papers on "Utilization and Treatment of Wastes by Biological Methods" to be held during the Congress in London in July, 1963. The symposium would be arranged jointly by the Water, Sewage and Industrial Wastes Division and the Fermentation Industries Division, and a small sub-committee to represent the two Divisions was appointed.

After approval of this proposal had been received, a working party was appointed. This has met in London four times, has considered the abstracts of papers received, and has arranged a programme for the symposium to be held on 15 July in London.

The report "Re-use of Water in Industry—a Contribution to the Solution of Effluent Problems", which was in preparation at the beginning of the period now reviewed, has been published by Messrs Butterworths this year.

By 1963 four members of the Committee, including the Chairman and Honorary Secretary, had completed their terms of office. Arrangements have been made for the Committee to meet during the Conference in London on 5 July when members and Honorary Officers to replace those retiring will be elected. In the meantime, the matter has been discussed by the Committee by correspondence.

VI.9 Pulp, Paper and Board Division

The Pulp, Paper and Board Division has not met since the Montreal Conference but plans to meet in London in 1963.

The International Committee for Cellulose Analysis (ICCA), Commission of this Division, has completed international methods for the Kappa number of pulp, for alkali solubility and for alkali resistance. These have been accepted as standard by the corresponding ISO Committee. It is proposed that we reconstitute this commission in London in order to devise satisfactory methods for international use for content of pulps. Whether to extend its activities to include paper analysis will be discussed in London.

Plans were made to follow the extremely successful Symposium on Wood Chemistry in Montreal with a symposium on the chemistry of papermaking to be held in London in 1963. However, for a variety of reasons it was decided to postpone this, particularly since the Technical Section of the British Paper and Board Makers' Association held a highly successful

symposium on this subject in Oxford recently and it was felt that this would follow too closely to justify a meeting in London at this time.

The paper industry of the world involves so many countries that it is impossible for all the important nations to be represented as titular members. Plans are underway to extend invitations to several important papermaking countries to name associate members so that they can participate in our efforts to disseminate information and to devise satisfactory methods.

The papers presented at the Symposium on Wood Chemistry in Montreal have been published by Butterworths in "Pure and Applied Chemistry". Plans have been made for the IUPAC publishers to have the methods of the ICCA Commission published as they appear.

VI.5 Toxicology and Industrial Hygiene Division

Arising out of discussions at the last meeting of the Division in Montreal, there has been an interchange of correspondence in preparation for the next meeting in London this year. The subjects which will be on the agenda will include methods for the determination of acetone, sulfur dioxide, cadmium, acid vapours, hydrogen fluoride, hydrogen selenide, methyl bromide and aromatic amines in air, and methods for the control of exposure to arsenic, mercury, trichloroethylene, benzene and carbon monoxide by the examination of blood and urine.

The Division has collaborated in the Second Symposium on Maximum Allowable Concentrations held in Paris during April, 1963, and sponsored jointly by IUPAC, the International Labour Office and the International Association and Permanent Commission on Occupational Health. This Symposium dealt with methods used to establish Maximum Allowable Concentrations and attempted to resolve the differences which exist between the various national lists; its proceedings and recommendations will be published in detail. A meeting was held by those members of the Division who were present on this occasion and recommendations from the Division have been incorporated in the proceedings of the Symposium.

The possibility of establishing an IUPAC Information Centre for Dangerous Substances has been further discussed, and the matter is now in the hands of the Bureau (see page 14).

VI.6 Pesticides Division

One of the main functions of the Pesticides Division is to arrange, periodically, international congresses on crop protection. The last one was held in Hamburg in 1956. Attempts were made to hold the Vth Congress in Southern Rhodesia, the USA and Switzerland, but without success. Arrangements have, however, been made to hold the Vth Congress in London on 17 to 23 July, 1963, after the XIXth International Congress of Pure and Applied Chemistry.

To avoid the limitations of the definition "Congress on Crop Protection", the name was changed into "Vth International Pesticides Congress". The Chairman of the Executive Committee of the Congress is the Chairman of the Pesticides Division (IUPAC). We are glad to report that Sir Robert Robinson, O.M., F.R.S., has agreed to preside over the Congress.

It was recommended by the Division Committee that the Congress should deal more fundamentally with a limited number of subjects than has been customary at previous congresses. The Scientific Papers Committee has selected the following topics:

(a) Selective Toxicity

(b) Mode of Entry and Translocation of Pesticides in Anthropods and Plants
(c) Host Selection Factors
(d) Metabolism of Pesticides
(e) Correlation between Biological Activity and Chemical Structure
(f) Pesticide Residue Analysis

Another function being performed by th Division is the collection of information regarding national and regional organizations concerned with different aspects of the use of pesticides. This work is being continued. A preliminary list will be issued later this year.

The Secretary participated in the FAO Conference on Pesticides in Agriculture in Rome, 12 to 27 November, 1962.

Until the end of 1963 the Pesticides Division consists of seven titular members including chairman and secretary.

VI.8 Organic Coatings Division

Since the 1961 meeting in Copenhagen, an interim meeting was held in Brussels, Belgium, on 8–10 October, 1962. Considerable time was devoted to discussions about the contemplated symposium on "Adhesion, particularly of Organic Coatings", to be held during the XIXth Congress in London 1963. Two sessions will be held on 16 July, during which ten papers—in addition to an introduction and a closing statement—will be delivered.

Sub-Committee on Analytical Methods

During two sessions a revised edition of the "Standard Methods for the Analysis of Drying Oils", circulated previous to the meeting, was thoroughly discussed. Due to the large number of suggestions arising from the discussions, a new version has been worked out by the chairman and forwarded to all members of the Sub-Committee. A final draft proposal is ready at the present time and this part of the work of the Sub-Committee is expected to be completed and ready for publication at the London meeting. All methods have been rewritten in order to conform with the methods contained in the new edition of "Standard Methods for the Analysis of Oils and Fats" worked out by the Oils and Fats Division.

The work on "The Analysis of Alkyd Resins" was taken up at a third session of the Sub-Committee, at which it was decided to limit the work during 1962/63 and at the London meeting to the analysis of the whole alkyd and to methods for splitting the alkyd resin into its components.

Sub-Committee on Testing Procedures

During the sessions of the Sub-Committee the work on the "Survey of Methods of Testing of Hardness" was discussed and the following layout of the book, worked out by Mr. Fink-Jensen, was approved:

(a) Preface
(b) Introduction
(c) Theory
(d) Hardness Testing Methods
  i. Instrumental Methods
  ii. Hand Methods
(e) National Standards for Hardness Testing (including other generally accepted methods)

After the discussion it was agreed that a working party composed of the contributors and a secretary be set up to finalize the draft of the whole script, with Mr. Fink-Jensen as editor. It was, furthermore, decided to attempt to have the script ready for formal approval at the meeting in London.

The Sub-Committee then discussed whether or not this field of work of the Sub-Committee should be continued for the purpose of working out recommendations for standardization of methods for hardness testing. Considering the many different practical questions involved in such work it was decided for the time being to postpone further discussion of this problem, and not to hold up the present book.

As far as the future programme of the Sub-Committee is concerned it was decided that the subject of flexibility would appear to complete the trio hardness, adhesion and flexibility. The work on this problem is to be taken up at the London Conference.

Sub-Committee on Terminology

The chairman of the Sub-Committee, Mr. Rabaté, presented copies of the tri-lingual dictionary, consisting of 263 pages, containing over 5000 French words with the majority of the corresponding English and German terms. A thorough revision of the English and German terms, which will be done by the English and German members of the Sub-Committee, is however still necessary.

In order to simplify the preparation of supplementary terminology lists in other languages it was decided to number one of the lists in the tri-lingual dictionary.

It is the opinion of the Sub-Committee that there should be no difficulty in selling at least 3000 copies of the tri-lingual dictionary at a price of £4–£5.

VI.7 Plastics and High Polymers Division

Since the last report (C.R. XXIst Conference, pp. 184–6) the Division has held two meetings; in Montreal on 3–4 August, 1961, during the XXIst Conference of the Union, and in Paris, 21 May, 1962, where the Division was a co-sponsor of the very successful Première Conférence européenne des Plastiques et du Caoutchouc, 21–26 May, 1962.

At the XVIIIth Congress in Montreal the Division was responsible for organizing four sessions on relationships between chemical structure of polymers and their (1) Physical (2) Mechanical (3) Electrical and (4) Rheological properties. Each session was introduced by an invited lecturer, as follows:

(i) Dr. R.F. Boyer, Midland, Michigan (USA): "Relationship of Polymer Transition Temperatures to Chemical Structure."
(ii) Prof. H.A. Stuart, Mainz (Western Germany): "Crystallization Phenomena in High Polymers."
(iii) Dr. W. Reddish, Welwyn Garden City (UK): "Chemical Structure and Electrical Properties of High Polymers."
(iv) Prof. S.G. Mason, Montreal (Canada): "Some Phenomena in the Rheology of Emulsions and Suspensions."

At the Conférence européenne in Paris, which had over 100 registrants in attendance, 11 members of the Division presented 12 of the 54 papers on the programme.

Future Meetings

The Division will be meeting in London during the XXIInd Conference, and at the XIXth Congress the Applied Chemistry Section is allocating three

half-day sessions at which the Plastics and High Polymers Division, the Food Division, the Toxicology and Industrial Hygiene Division, the Pesticides Division and the Pulp, Paper and Board Division will jointly sponsor a symposium entitled: "Food Packaging Materials; Toxicological and Analytical Problems."

Liaison

The Division has continued to maintain liaison with the Macromolecular Commission and with the International Standards Organization Technical Committee for Plastics (ISO/TC. 61).

Programme of Work

Work is continuing on the 18 items suggested at Düsseldorf as useful activities of the Division on an international scale and listed in C.R. XXIst Conference, p. 185.

(a) *Report on Classifications of Plastics*

Dr. O. Leuchs, as Chairman of the Task Group on Classifications of Plastics, is continuing his studies on this question and he will be circulating a supplement to the document "Classifications of High Polymers: A Critical Review" as soon as possible.

(b) *Report on Abbreviations*

A report is in preparation and will be circulated to members prior to the London meeting.

(c) *Report on Compilation of Food and Drug Laws, Customs Classifications and Plastics Production Statistics*

Dr. G.M. Kline is compiling reports on these subjects based on information collected from member countries.

(d) *Report on Plastics in the Building Industry*

This report by Dr. G. Saccenti has been published, as a product of the Division, in the following journals: Plastics, February, 1962 (England); Modern Plastics, April, 1962 (USA); Bouw, 17 May, 1962 (Holland); Materie Plastiche (Italy); Polimery (Poland); Kunststoffe (Germany).

(e) *Corrosion Problems, including Attack and Protection*

An article on this subject is in course of preparation for publication.

(f) *Relation of Performance Characteristics to Basic Parameters of Polymers*

Dr. J.W. Barrett is organizing a small working party to consider the action to be taken in regard to this programme, which will meet in London in July, 1963 during the XXIInd Conference.

(g) *Classification and Nomenclature of Multiple Transitions in Organic High Polymers*

Dr. R. Boyer has prepared a report containing his proposals on this subject which is in course of circulation for comment.

(h) *Crystallinity of Plastics*

Prof. Natta has proposed a study of the methods of measuring crystallinity of polymers and it is hoped to have a document on this subject for consideration at the London meeting.

(i) *Infrared Spectra of Polymers*

Dr. Henniger is preparing a report on the infrared spectra of polymers and resins.

(j) *Report on Spherulites*

Dr. F. Ecochard is responsible for the compilation of a report on spherulites in polymers.

J.H. Bushill, President

REPORT ON THE ACTIVITIES DURING THE LONDON CONFERENCE

APPLIED CHEMISTRY DIVISION

Minutes of the Meeting of the Applied Chemistry Division Committee

held on Thursday, July 4, and Monday, July 8, 1963, in the Engineering Building, University College, London W.C.1

Part I: Thursday, July 4, 1963

Present: Dr. J.H. BUSHILL, President of the Division (in the Chair); Messrs. BOUDÈNE, DRING, FREY, GABRIELSON, GAGE, GALLAY, GALLEY, GENEVOIS, JORDAN, KLINE, LIGHT, OSER, STURM, TRUHAUT, WARD, WOLFF, and H.J. BUNKER (Hon. Secretary).

(1) *Apologies* for absence were received from Dr. SOUTHGATE (England), Mr. BERTRAND (Belgium), Prof. PATAT (Germany), and Dr. BOEKENOOGEN (Netherlands).

(2) The President *welcomed* new comers to the Committee, and particularly Dr. GABRIELSON (Sweden) who had been appointed a member of the Division Committee. Prof. PATAT and Prof. WOROSCHOZOW had been appointed at the same time but were absent. Dr. STURM had been appointed to the Committee in 1961.

(3) *The minutes of the previous meeting* held on Aug. 3 and 4, 1961, in Montreal had been previously circulated.

(4) Matters arising from the minutes of the previous meeting. There were no matters arising other than those on the agenda for the present meeting.

(5) *New Division President.* The President announced that as a result of a postal ballot, Prof. R. TRUHAUT (France) had been elected President of the Division and would take office at the conclusion of the present Conference. Dr. BUSHILL congratulated Prof. TRUHAUT on his election and Prof. TRUHAUT replied briefly, thanking Dr. BUSHILL and assuring the Committee of his intention to do everything possible to support the activities of the Division.

(6) *Appointment of Honorary Secretary.* This was deferred until the second part of the meeting, to be held on July 8.

(7) *Matters raised by the President.*
(a) *Change in name of the Section.* Under the proposed new Statutes, the Sections would become Divisions and Divisions would be designated Sections. [The new Statutes were adopted and therefore the new terminology is used in these minutes.]
(b) *Proposed Bureau of Information on health hazards from chemicals used in Industry.* The President referred to an interim report given by the Secretary General to the Division Presidents at their meeting in March 1963. Broadly it had appeared that the large (highly industrialised) countries did not think the project necessary, the medium-sized countries felt there was a need for such a scheme, while the small countries were not particularly interested and thought language difficulties might be an obstacle. Further information on the topic would be available later in the Conference, after

the Bureau meeting. The question of cost would no doubt have to be considered.

(c) The President referred to the unacceptability to the Union of affiliation with other international bodies, since affiliation was tantamount to fusion. What *was* acceptable however, was liaison with such bodies, and examples of this in the Applied Chemistry Division were (a) an arrangement with ICUMSA (International Commission for the Uniform of Methods of Sugar Analysis) by which a representative of that body could attend meetings of the Food Section and (b) a proposed similar arrangement between IAMS (the International Association of Microbiological Societies) and the Fermentation Industries Section.

(d) *Codex Alimentarius.* The President reported that IUPAC had been asked for assistance on chemical matters by the Codex Alimentarius Commission of FAO/WHO. The Union considered that such enquiries would fall mostly within the normal field of activities of the Applied Chemistry Division and therefore had requested the Division to suggest a suitable mechanism to meet the requirement. It was proposed, seconded and agreed unanimously that an immediate *ad hoc* committee be formed, consisting of Dr. BUSHILL, Prof. TRUHAUT and the Chairmen of the Food, Pesticides and Oil and Fats Sections and that the President of the Analytical Chemistry Division also be invited. This committee should meet at 6 p.m. on the following day, Friday, July 5, to frame proposals.

(e) *Other organizations.* It was stated that queries of a chemical nature were also to be anticipated from ISO. Should that be so, a mechanism could be devised by the Applied Chemistry Division for the queries to be channelled, through the Secretary General, to the appropriate Chairmen and Secretaries of the Sections.

8. *Reports of Sections and Commissions.* On account of time available only a few matters could be dealt with during this part of the meeting.

VI.9 *Pulp, Paper and Board Section*

The Chairman considered that the work of a Section, as in his Section, consisted of two functions, the fact-finding work of Commissions and the dissemination of information. The latter could be largely effected by the holding of symposia, and the Union should be asked to release funds for this purpose.

VI.8 *Organic Coatings Section*

The Chairman pressed for a decision on whether the Union was prepared to back financially the tri-lingual glossary of terms which members of this Section had prepared by several years of unpaid labour (except for one grant of 300 dollars). The President undertook to endeavour to get a definite answer to this question.

The Chairman also considered that the arrangements for the payment of travel and subsistence to members attending IUPAC Conferences should be more elastic. Where a number of the Titular Members could not come, some of the money saved might be used for other purposes in the Division, such as assisting travel expenses of non-titular members. He cited the instance of his own Section in which only 3 Titular Members were coming whereas about a dozen non-titular members were attending. The President indicated that this point had been discussed by the Bureau many

times; during a period of financial stringency it was unlikely that the present policy would be changed.

The Chairman referred to the recent innovation whereby the efficiency of working might be improved by the President and Secretary of a Division being of the same nationality. He enquired whether the same applied to the Sections, for, if so, and in view of the limited number of titular members, the geographical representation would be very limited. It was indicated that the above would be permissible if the Section considered that the advantages would outweigh the disadvantages already mentioned. Other representatives indicated that having the Chairman and Secretary of Sections in different countries had not proved particularly inconvenient, and Mr. DRING suggested that a simplification might be effected by combining the office of Chairman with that of Secretary of a Section.

Part II: Monday, July 8, 1963

Present: Dr. J.H. BUSHILL, President of the Division (in the Chair); Messrs. BERTRAND, BOEKENOOGEN, BOUDENE, DRING, FRANÇOIS, FREY, GABRIELSSON, GAGE, GALLAY, GALLEY, GROSS (Representative of ICUMSA), JENSEN, JORDAN, KLINE, LIGHT, LUNDIN, NIELSEN, OSER, STURM, SUOMALAINEN, TREBOUX, TRUHAUT, WARD, WOLFF and H.J. BUNKER (Hon. Secretary).

9. The Chairman welcomed those who had been unable to attend the previous meeting of the Committee. He particularly extended a welcome to Dr. GROSS who was a representative of the International Commission for Uniform of Methods of Sugar Analysis (ICUMSA) and would be acting as a liaison between that body and the Food Section of the Applied Chemistry Division of IUPAC.

10. *Reports of Sections.* Reports of Sections had only been dealt with in part at the earlier meeting of the Division Committee, but could now be amplified because of the meetings of individual Sections in the interim.

VI.1 *Food Section*

A report on the estimation of copper by the Trace Elements in Food Commission had been published: the report on lead was in final draft and that on mercury required editorial revision, but should be ready shortly when the Commission would be dissolved. The Food Additives Commission was continuing its survey of official methods of estimation of additives—of which there were well over 100 major items—employed in different countries. Permission had been given for a new Trace Elements Commission to deal with boron, fluorine and selenium, but it now appeared that at least two new topics of greater urgency had arisen: these were concerned with (a) polycyclic aromatic compounds in smoke and smoke residues from smoking of foods and (b) mycotoxins in mouldy grain and meal (e.g. Aflatoxin in mouldy ground nuts). The Section therefore asked for one new Commission, on Trace Substances in Food, to deal with one of the above three topics, according to which proved the most urgent, after further investigation. The Section wished to meet in 1964, at the same time as the Additives Commission, in New York, at the time of the Biochemical Congress. Two Titular Members would be retiring and their replacements would depend on the nature of the work of the new Commissions.

VI.2 *Fermentation Industries Section*

The Commission on Characterization of Dried Yeasts had completed its report and sent it forward for publication. The Commission on Fusel Oils expected to complete its work in 6 months' time, pending which its members would become associate members of the Section, and at the end of that period the Commission would be dissolved. Liaison was recommended with the Office International de la Vigne et du Vin, through Prof. GENEVOIS as an Associate Member of the Section.

The next task the Section suggested undertaking was a global survey of fermentation industries, to reveal problems in the fermentation field which might have an influence on international trade. No expense to the Union was expected except that a meeting of the Section was deemed desirable somewhere in Western Europe in the first half of 1964, to evaluate the results of the survey.

VI.3 *Oils and Fats Section*

The following topics had been dealt with:

(i) Determination of foots in linseed oil;
(ii) Determination of the sum of unsaponifiable and unsaponified matter in soaps;
(iii) Determination of K and mixtures of Na and K in soaps:
(iv) Adoption of gas chromatography for the identification of the components of an oil.

The following topics would be studied during 1963/64:

(1) Free alkali in soaps (new method).
(2) Unsaponifiable matter in soaps and oils (revision).
(3) Bömer value.
(4) Solidification curve of fats.
(5) Acid value, hydroxyl value, saponification value by potentiometry in highly-coloured mixtures.
(6) Melting point and slippoint, in collaboration with the International Organization of Chocolate Manufacturers.
(7) Ultra violet spectrophotometry of polyunsaturated acids and also gas chromatography of these products.
(8) Differential thermal analysis.

Publication was envisaged of 5 methods plus the particular specifications standardized by the Organic Coatings Section, on the subject of methods standardized by the Oils and Fats Section.

Discussions took place on costs incurred in alterations to the galley proofs of reports awaiting publication. The Chairman of the Publications Committee had also complained about the time taken over the corrections.

VI.4 *Water, Sewage and Industrial Wastes Section*

The Section unanimously agreed to propose that they should undertake the compilation, with a view to publication, of the standard methods adopted in different countries for the determination of the most important properties and constituents of polluted waters and of sewage and industrial effluents. Approval for this project was sought. The published volume would probably contain about 250 pages,—that is, it would be approximately the same size as the recently published "Re-use of Water in Industry". It was expected that the Section would need to meet once a year probably during the next four years.

VI.5 *Toxicology and Industrial Hygiene Section*

Methods of determination of a number of toxic substances in the air, etc., was being studied, particularly in relation to the hazards of exposure of workers in industrial processes. Some of the methods agreed would be ready by the time of the next meeting. Methods for measurement of mercury, acetone and benzene in blood and urine were in draft form. Methods for determination which could be used by untrained personnel were being considered, but difficulties have been encountered. The Section collaborated in the 2nd Symposium on Maximum Allowable Concentrations held in Paris in April, 1963, and sponsored by IUPAC, ILO and the International Association and Permanent Commission on Occupational Health. The Section hoped to meet in Paris two years hence.

VI.6 *Pesticides Section*

The principal activities of the Section had been in connection with the organization of the Pesticides Congress to follow immediately on the present IUPAC Congress. The Section was also collecting information regarding national and regional organizations concerned with different aspects of the use of Pesticides.

VI.7 *Plastics and High Polymers Section*

Work was continuing on a variety of subjects and it was hoped to have one or more reports ready for publication before the next meeting. They included a further report on the Classification of Plastics, and reports on Standard Abbreviations; Food and Drug Laws; Customs Classifications; Plastics Production Statistics; Relationship of Performance Characteristics to Basic Parameters of Polymers; Transitions in Organic High Polymers; Classification and Nomenclature of Multiple Transitions in Organic High Polymers; Corrosion Resistance of Plastics; Infrared Spectra of Polymers; Spherulites; Crystallinity of Polymers.

VI.8 *Organic Coatings Section*

Further discussion took place on the difficulties of this Section in securing financial support (£2000) from IUPAC for the tri-lingual glossary. The President indicated that he understood from the Chairman of the Editorial Board that that body does not at present propose to recommend financial support for the above project. Should that prove to be the final answer the Division Committee recommended that permission should be sought to submit the proposition directly to Messrs. Butterworth or other publisher.

VI.9 *Pulp, Paper and Board Section*

The representation of various countries by Titular Members was considered and the necessity for greater representation either by Titular or Associate membership stressed. Relationship of the International Commission on Cellulose Analysis (ICCA) with ISO, and their respective functions were discussed. The work of ICCA to date would be reported and the Commission reconstituted, to consider such topics as satisfactory methods for estimating carbonyl content and chromatographic analysis of carbohydrate constituents. A second commission, to deal with chemical analysis of paper had already been approved (Bureau meeting, 1961), and its composition was now being arranged.

The usefulness of symposia in fields not yet covered, was emphasized and as an example "Chemical Aspects of Paper Making" was discussed. Various items for such a symposium were noted but no immediate recommendations

made. The possibility of a short symposium in connection with the 1964 meeting of IUCEPA and TAPPI in Venice was considered and the Chairman of the Section was asked to investigate.

(11) *Liaison with Food Standards Commission of FAO/WHO.* Arising from the discussion at the meeting arranged for Friday July 4 [see minute (7) (d) above] various recommendations had been agreed which are given in detail in the Report made to Council by the President of the Applied Chemistry Division on July 9 (see Appendix).

(12) *Responsibility for Publications.* The President drew attention to the fact that technically the Division President is personally responsible for all publications emanating from the Sections and Commissions of his Division. It was recommended that while this over-all responsibility must continue, the President should be permitted to delegate responsibility for technical accuracy to his Section Chairmen.

(13) *Industrial Representation in the Applied Chemistry Division.* Mr. DRING asked that in considering the Officers of the Applied Chemistry Division and its Sections, care should be taken to ensure that there was always good representation of the technological side of Applied Chemistry.

(14) *Division Officers.* Subject to approval by the Bureau, the following were declared officers of the Division: President: Prof. R. TRUHAUT (France); Vice-President: Dr. W. GALLAY (Canada); Joint-Secretaries: Prof. H. GARDY and Prof. P. BOURBON (France); Past President: Dr. J. H. BUSHILL (England).

(15) *Executive Committee.* The following were elected as the Executive Committee of the Division: The Officers and Mr. R.F. LIGHT.

(16) *Biographical Notes on Officers.* Mr. DRING drew attention to the practice of giving notes on the biographical background of candidates for official positions in the Division and hoped the practice of sending out such notes with ballot papers would be continued.

(17) *Liaison with Chemical Engineering.* The President-Elect, Prof. R. TRUHAUT, stated his intention of endeavouring to foster close liaison between the Applied Chemistry Division and Chemical Engineering Organizations: he proposed to raise the matter with the Bureau. It was with this object in mind that he had nominated Prof. H. GARDY a chemical engineer, as a Joint-Secretary of the Division.

(18) *Retiring Officers and members of the Division Committee.* The President cordially thanked the retiring Secretary and other members of the Committee for their help and co-operation during his term of office, and Prof. TRUHAUT thanked Dr. BUSHILL for his efficient and untiring work for the Division during the whole twelve years of his holding office in the Division; eight years as Secretary and four as President.

(19) *Particulars of Section Membership,* The Secretary strongly urged those Chairmen and Secretaries of Sections present to take away and complete forms giving details of the full membership of their Sections. The information was wanted at the earliest moment by the Secretary General for the prompt preparation of the Comptes Rendus.

(20) *Next Meeting.* The next meeting was expected to be held in 1965 at a place in Western Europe.

APPENDIX TO THE MINUTES OF THE MEETING

of the Applied Chemistry Division Committee, London, July. 1963.

Liaison with Food Standards Commission of FAO/WHO

The Applied Chemistry Division formed an *ad hoc* committee to consider appropriate mechanism to provide chemical advice and information to the above Commission. The *ad hoc* committee consisted of representatives from the three Sections, Food, Pesticides, and Oils and Fats, together with representatives from the Analytical Division. The following is the report issued on the subject:

The scientific and technological programmes of the WHO and FAO, and in particular their recent assumption of responsibility for the Codex Alimentarius project, often require chemical matters to be referred for review and recommendations by specialists in these areas. Since it is the desire of IUPAC to co-operate with these international agencies when consulted on chemical questions, it is proposed, after due consideration of its capabilities and of the responsibilities involved, that IUPAC create an *ad hoc* committee to be composed of the following members:

The President of the Applied Chemistry Division, the Chairman of the Food Section, the Chairman of the Pesticides Section, the Chairman of the Oils and Fats Section, the President of the Analytical Division.

The Chairman of the Liaison Committee should be the President of the Applied Chemistry Division.

It shall be the purpose of this Liaison Committee (a) to receive, via the Secretary General of IUPAC, from the Codex Alimentarius Commission, requests for opinions or advice of qualified specialists relative to chemical problems in the areas listed below: (b) to decide whether the consideration of these problems falls within the scope and capabilities of any of the existing Sections, Divisions or Commissions of IUPAC, or of any *ad hoc* group which may be formed for such purpose; (c) to seek appropriate authority and financial support for the assignment of these problems; (d) to expedite the consideration of the problems and the submission of a final report of the recommendations of the IUPAC Group, to the original requesting agency.

Chemical questions which might appropriately be referred to IUPAC may be within the following areas:

(1) Nomenclature of chemical substances including common names to replace complex chemical terminology.

(2) Definitions and specifications for the identity, purity, and quality of chemical substances.

(3) Analytical procedures for the determination of conformity to definitions and specifications of chemical substances (e.g. Food Additives, pesticides, etc.).

(4) Analytical procedures for the determination of the presence, qualitatively and quantitatively, of chemical substances in feeds, foods or their ingredients.

It will be understood that matters relating directly to the definitions and standards for foods, or to problems of public health shall not be referable to IUPAC *except in so far as they may be of a strictly chemical nature* and fall within one of the categories listed above.

VI.3 Section des Matières grasses

Réunions tenues à Londres les 6 et 8 juillet 1963

Toutes les réunions eurent lieu dans les locaux de l'Université de Londres (Engineering building).

Première Réunion du samedi 6 juillet 1963

Membres titulaires

M. G. WOLFF (France), Président; M. H.K. BOEKENOOGEN (Pays-Bas), Vice-Président; M. J.E. BERTRAND (Belgique), Secrétaire;

Membres

MM. E.L. DELVAUX (Belgique); M. MALENICKY (Tchécoslovaquie); Mme E. LEWKOWITSCH (Grande-Bretagne); MM. K.A. WILLIAMS (Grande-Bretagne); W.V. LEE (Grande-Bretagne); W.D. RAYMOND (Grande-Bretagne); F.D. SNELL (USA), H.K. STURM (Suisse), A. BOSSHARD (Suisse), G. WEDER (Suisse), H. HEINZ (République fédérale allemande), A. HEESCH (République fédérale allemande), J. GRACIAN (Espagne), G. LOEW (Argentine), F. EICHLER (Autriche), G. HALPIN (Irlande) V. DAVIDSON (Irlande), V. BARRY (Irlande), J. ERRBOE (Danemark), S.B.L. CHRISTENSEN (Danemark)

Assistent en outre aux réunions comme observateurs:

pour le Danemark: A. PETERSEN, pour la France: J.P. WOLFF, pour l'Italie: R. MONACELLI, pour la Grande-Bretagne: A. MACMASTER et H. WEATHERALL

Se sont excusés: MM. M. LONCIN (Belgique), A. RUTKOWSKI (Pologne), Mme H. GRYNBERG (Pologne), MM. H. NIEWIADOMSKI (Pologne), C. SKIBSTED-LARSEN (Danemark), J. HOLMBERG (Suède), N. EMBREE (USA), E. SALLEE (USA), F. HOEKE (Pays-Bas), H.J. VOS (Pays-Bas), J. BALTES (République fédérale allemande), J. VIZERN (France), J. POKORNY (Tchécoslovaquie).

A 9 h 15 le Président G. WOLFF ouvre la séance en souhaitant la bienvenue à tous les membres et aux personnalités qui nous honorent en assistant comme observateurs à nos réunions. Il exprime sa joie de pouvoir féliciter notre Vice-Président H. BOEKENOOGEN pour sa récente nomination aux Pays-Bas comme Professeur. Il remercie également la division britannique pour les arrangements pris par celle-ci pour nous recevoir.

I. Composition de la Section pour 1963–1964

M. J.E. BERTRAND (Belgique) rappelle que, suivant les règlements de l'IUPAC, il a terminé son terme de deux fois quatre ans de secrétaire et qu'il y a lieu de pourvoir à son remplacement. Il profite de l'occasion pour remercier la Division de la confiance qu'elle lui a marquée depuis dix ans, et souhaite que son successeur lui donnera un nouvel élan, aidé en cela par tous les membres.

M. G. WOLFF remercie M. J.E. BERTRAND et regrette le départ de celui-ci, qui fut la cheville ouvrière de la Division pendant tant d'années. Il rappelle qu'à Londres en 1961 il avait accepté la Présidence pour deux ans. Il accepte de garder celle-ci encore un an en intérim de M. BOEKENOOGEN, qu'il propose

comme nouveau Président, M. BERTRAND le remplaçant alors comme Vice-Président. M. H.J. Vos (Pays-Bas) deviendrait secrétaire dès 1963.

Ces propositions sont acquises aux applaudissements de l'assemblée.

H.J. Vos

II. Les Réunions

Dans son rapport, le Président révèle les relations que la division a eu avec divers groupements dont les activités rencontrent les nôtres, comme l'Association Internationale des Triturateurs de graines (IASC), l'ISO, Comité TC 35, le CID, l'AIS, les Chocolatiers, la FAO. Il donne également des renseignements intéressants sur la Nouvelle Rédaction des Méthodes normalisées, le Ier Supplément aux nouveaux textes et sur la vie de l'IUPAC.

Après le rapport du Président, les participants discutent, au cours de deux réunions, les résultats des recherches qui ont été faites dans le cadre du Programme de Travail 1962–1963 et qui concernent en outre les déterminations suivantes: Insaponifié – insaponifiable dans les savons, Chromatographie en phase gazeuse (préparation des esters méthyliques, préparation de la phase fixe, standardisation avec un mélange connu d'esters méthyliques d'acides gras, analyse d'un corps gras), dosage du K et du Na dans les savons, Indice Bömer, Courbe de solidification. A la suite de ces discussions, le Programme de Travail 1963–1964 est établi.

Pendant la troisième réunion, destinée aux problèmes divers concernant la Division des Matières grasses (dont le nom est changé en Section des Matières grasses), M. WOLFF fait mention de quelques difficultés en ce qui concerne l'édition des méthodes.

[Le Procès-verbal complet des Réunions de Londres – 25 pages – peut être demandé au Secrétaire de la Section]

H.J. Vos

VI.6 Pesticides Section

London, Monday, July 8, 1963.

Present were: Dr. R.A.E. GALLEY (Chairman); Prof. M.E. ALESSANDRINI; Dr. M.C. CHABROLIN; Dr. H. HURTIG, Dr. J. TREBOUX (Secretary).

Appologies for absence were received from: Dr. Z. ECKSTEIN, Mr. R. TAKAHASHI.

The agenda of the Meeting was accepted as follows:

(1) Minutes of prevous meeting.
(2) Matters arising from minutes.
(3) Nomenclature of phosphoric acid esters.
(4) Organizations concerned with pesticides problems.
(5) Collaboration with other international bodies.
(6) Next International Congress on Pesticides.
(7) Elections and membership of the Pesticides Section.
(8) Any other business.

(1) *Minutes of previous meeting.* No comments were made on the minutes of the Fourth Meeting.

(2) *Matters arising from minutes.* All items arising from the minutes were covered in the Agenda.

(3) *Nomenclature.* As proposed at the Fourth Meeting, the Secretary approached the IUPAC Commission on Organic Nomenclature asking for a recommendation on names for phosphoric acid esters. The answer of Prof. P.E. VERKADE, President of the above Commission, as well as some further inquiries showed that the correct expressions are for instance:

0,0-Dimethyl (1-hydroxy-2,2,2-trichloroethyl) phosphate	for Dipterex
0,0-Diethyl 0-(4-nitrophenyl) phosphorothioate	for Parathion
0,0-Dimethyl S-[1,2-di-(ethoxycarbonyl) ethyl] phosphorodithioate	for Malathion

These names correspond to the nomenclature given in the "Handbook for Chemical Society Authors" issued in 1960.

Dr. CHABROLIN pointed out that in France expressions as Thiophosphate de 0-(nitro-4-phényl) 0,0-diéthylique are still used. In the French edition of their Specifications for Pesticides 1961 WHO gives the following names:

Phosphonate (hydroxy-1 trichloro-2,2,2 éthyl) 0,0-diméthylique	for Dipterex
Phosphorothioate 0-(nitro-4-phényl) 0,0-diéthylique	for Parathion
Phosphorodithioate S-[bis(éthoxycarbonyl)-1,2 éthyl]0,0-diméthylique	for Malathion

Dr. HURTIG asked whether the names—as given by the Handbook for Chemical Society Authors—are in accordance with the rules of ISO. This will be investigated. The Committee draws attention to the fact that for the phosphoric acid esters, and for other chemicals, the correct names are not always used.

(4) *Organizations concerned with pesticides problems.* The third edition of the list was discussed and the following additions made:

(a) Pesticides group of the European Common Market. This organization deals with the analysis of formulations and residue determinations. To avoid duplication, a rapporteur had been appointed to report on other bodies already active in these fields.

(b) FAO Committee on the Use of Pesticides in Agriculture. This is now a permanent body with a budget. It has the power to call meetings. Dr. WESTLAKE acts as secretary in Rome.

(c) Codex Alimentarius, the joint WHO/FAO Commission with the headquarters in Rome and Mr. TOWNSEND as secretary.

(d) GEFAP—Groupement Européen des Associations Nationales de Fabricants de Pesticides. The headquarters are in Brussels, 49, square Marie-Louise; Mr. N. CHARLIERS acting as secretary general.

(5) *Collaboration with other international bodies.* It is possible that WHO, FAO or the Codex Alimentarius Commission will request opinions or advice of qualified specialists on chemical problems, for instance analytical methods, nomenclature, specifications, and so on.

Dr. OSER, the chairman of the Food Section of the Applied Chemistry Division proposed that an *ad hoc* group be created for liaison with FAO, WHO and the Codex Alimentarius Commission, to be composed of the following members: the Chairmen of the Applied Chemistry Division, the Food Section, the Analytical Division, the Pesticides Section and of the Oils and Fats Section.

If the Bureau of IUPAC agrees and the International Organizations mentioned use the services of the proposed Liaison Group, a certain amount of work is likely to arise for our Section.

Dr. HURTIG explained the collaborative work of WHO and FAO and gave our Section a better understanding of the kind of problems on which our help might be asked:

In the joint Program on food additives, we have to distinguish between the conferences of the experts dealing with various problems, and the Intergovernmental Conference on Food Additives which created the Codex Alimentarius Commission. The latter consists of government representatives of all participating countries .The tasks of the Codex Alimentarius are:

(a) Compilation of existing information
(b) Definition
(c) Agreement on specifications.

It is financed by trust fund contributions of the member governments in form of a fixed annual fee. At the moment there are 35 to 40 members.

The Codex Alimentarius does not initiate any new work, but only collects existing information.

The activities of WHO and FAO in the pesticides field are:

WHO (1) Expert Committee on Pesticides dealing with the formulations.

(2) Expert Committee on Pesticides Residues, one group of which deals with toxicology.

FAO The Expert Committee on the Use of Pesticides in Agriculture proposed in its meeting in November 1962 four working parties:

1. A working party on pesticides residues which should cover.
1.1 Toxicity
1.2 Tolerance
1.3 Analysis
1.4 Surveys for collecting residue data.
2. A working party on registration, approval and labelling of pesticides.
3. A working party on pest resistance to pesticides in agriculture.
4. A working party on occupational hazards in the use of pesticides.

A joint meeting of the Toxicology Group of the Expert Committee on Residues of WHO and the corresponding working party of FAO will take place in October, 1963, in Geneva and discuss the acceptable daily intakes of 30 pesticides.

Recently the Codex Alimentarius Commission decided to support the work of experts when data are needed and not otherwise available. $125000.— can be spent yearly for this purpose and for meetings of experts.

Because WHO and FAO are not in a position to cover the whole field, groups of countries are appointed to deal with specific questions. The responsibility to straighten out differences of opinion in such a group is given to one country which is free to call meetings, but has also to provide the finances.

What our Section has to keep in mind is mainly:

—FAO is interested mostly in residue analysis, i.e. micromethods. Work in this respect is done by EPPO and AOAC; possibly also by a working party of the European Common Market.

—WHO is collecting methods and preparing specifications for formulations including macro-analytical methods. CPAC and AOAC initiate work in the latter field.

—The task of both FAO and WHO is to help the developing countries which

are seeking advice and help, and not settling differences of opinion between industrial and fully developed countries.

—IUPAC and our Section would be glad to help by providing the wanted information through the earlier mentioned liaison group, but is aware of the fact—and so is our Section—that it is not possible to do more voluntary work than is already done. If we were asked to elaborate methods, we would need the necessary funds as well as qualified personnel.

—To be prepared for the above described task, it was agreed that the Section would contact the respective organizations and ask them for already existing methods, as well as for their plans.

(6) *Next Congress.* The Section Committee agreed that a Pesticides Congress should be held every four years, always taking into consideration the dates of other congresses covering partly our field, and avoiding overlapping.

Dr. Hurtig was asked to find out from the authorities in Israel whether they would be willing to sponsor a Pesticides Congress. If this were not possible, we would try to find a sponsor in Italy. FAO had expressed their willingness to co-operate if the Italian Government would participate. FAO has the facilities and could do the secretarial work. Two difficulties to be overcome are

(a) the fact that not all IUPAC Member Countries are members of FAO, and

(b) that a congress would need to be an IUPAC and not a FAO congress.

(7) *Elections and membership of the Commission of the Pesticides Section.* As the 4-years' term of office for the Chairman and Secretary had expired, elections were held. Dr. J. Treboux was appointed as Chairman, and Dr. H. Hurtig as Secretary. Dr. R.A.E. Galley as immediate past chairman remains as Titular Member of the Section.

The Secretary thanked Dr. Galley for his work. The members of the Committee, and especially the newly elected officers, were glad that Dr. Galley would remain in the Committee to help ensure the continuity of the policy of our group.

Prof. M.E. Alessandrini was re-appointed for further two years.

The membership of Dr. Z. Eckstein and Mr. R. Takahashi ended with this year's conference.

To improve the geographical distribution of the titular members, the Section Committee proposes to the Division Committee that three new members be elected from Israel, Brasil and Russia respectively. A representative from Israel is particularly desirable in view of the possibility of holding the next Pesticides Congress there.

After approval by the Division, we will contact the appropriate authorities to find candidates for membership.

(8) *Other activities of the Pesticides Section.* The possible influence of the book by Miss Carson on the worldwide use of pesticides was discussed. The Committee is of the opinion that there cannot be any serious antagonism against pesticides in the long term. What we can do in this matter is to ensure the proper handling and so to minimize any dangers arising from the use of chemicals in this field.

The Section Committee is aware of the fact that many other organizations are active in our field. We are glad to offer help, but we want to avoid duplication of work.

There is one very useful service we could provide: to study the question of accumulation and transportation of pesticides from small organisms to e.g. fish and eventually to man. Possibly a symposium on this item could be held in conjunction with the next IUPAC Congress.

VI.7 Plastics and High Polymers Section

London, July 6, 1963

Members present: Mr. G. DRING, Chairman (England); Dr. G.M. KLINE, Vice-Chairman (USA); Dr. A.F. MCKAY, Secretary (Canada); Dr. J.W. BARRETT (England); Dr. R.F. BOYER (USA); Dr. J.W. BREDT (Netherlands); Dr. P. DUBOIS (France); Dr. F. ECOCHARD (France); Dr. I. FRANTA (Czechoslovakia); Mr. A. GROSS (France); Dr. L. GRUEN (Australia); Dr. J. HEIJBOER (Netherlands); Dr. O. LEUCHS (Germany); Mr. M. RODEYNS (Belgium); Dr. P. WEISS (USA).

The meeting of the Plastics and High Polymers Section was opened by the Chairman with a call for a moment of silence in respectful memory of Dr. A.G. NASINI and Dr. A. BORYNIEC. The recent deaths of these members are deeply regretted.

(1) *Minutes of previous Meeting.* The minutes of the meeting in Paris on May 21, 1962, which had been circulated, were approved.

(2) *Macromolecular Commission.* The Chairman reported that the Macromolecular Commission had held a Symposium in Paris, July 1–6, with approximately 700 in attendance. They had received a report on round-robin tests of molecular weight determinations made on three polystyrene samples by various laboratories. The final report will be published in the "Journal of Polymer Science". Attention of all members and delegates was drawn to the fact that the remaining amounts of two of the polystyrene samples will be kept by the National Bureau of Standards for distribution to all laboratories requesting them for calibration purposes. The Commission considered a proposal concerning criteria for patentability of new polymeric compounds now under study by EEC countries and designated two members to act in a liaison capacity with the patent study group. *The next meetings* are scheduled to be held in *Prague*, Czechoslovakia, in *1965* and *Tokyo* in *1966*.

(3) *Classification of Plastics.* A 14-page document by Dr. LEUCHS on classification systems for plastics was discussed. Dr. LEUCHS stated that the method of classification would be determined to a degree by the envisioned use of the classification system. He will prepare a report on this subject for publication by the IUPAC. This report will supplement the previously published IUPAC report (1960) and it will include a proposal for an international classification system. Dr. LEUCHS expressed his thanks to Dr. I. FRANTA (Czechoslovakia), Dr. P. DUBOIS (France), Mr. TECHEL (East Germany), Prof. KOTON (Leningrad) and Prof. HARDY (Budapest) for their interest in this work and their helpful suggestions.

(4) *Report on Standard Abbreviations.* Dr. KLINE has collected additional information on abbreviations that have been standardized or are in common usage in various countries. These will be compiled for use as a basis for preparation of a draft proposal for standard international abbreviations for plastics. This project is being conducted in co-operation with Technical Committee 61 on Plastics of the International Standardization Organization.

(5) *Customs and Plastics Statistics Classification.* The categories in which plastics are grouped for customs purposes and for reporting production statistics in 10 to 12 countries have been forwarded to Dr. KLINE for compilation. It is hoped that this section can promote some standardization in these areas by reviewing the existing classifications and proposing a system as an international standard.

(6) *Relationship of Performance Characteristics to Basic Parameters of Polymers.* A working party, under the chairmanship of Dr. J.W. BARRETT, met at the end of the meeting to outline a program for acquiring information on this subject. Members of this working force are Dr. S. BAXTER

(England), Dr. R.F. Boyer (USA), Dr. J.W. Bredt (Netherlands), Dr. I. Franta (Czechoslovakia), Dr. J. Heijboer (Netherlands) and Mr. R. Rodeyns (Belgium).

(7) *Classification and Nomenclature of Multiple Transitions in Organic High Polymers.* Dr. Boyer circulated copies of a report on this subject to all members of this section. Comments and suggestions were received from many sources and these will be considered in the revision of the report. Dr. Boyer anticipates that it will require approximately two years to reach general agreement on a document acceptable for IUPAC recommendation.

(8) *Crystallinity of Polymers.* Dr. Natta is preparing a report on methods for measuring crystallinity of polymers and relationships between crystallinity and physical properties. It is expected that the report will be available for circulation by the end of the year.

(9) *Corrosion Resistance of Plastics.* The desirability of compiling available information on the resistance of plastics to various chemical environments was discussed. Dr. Dubois will prepare a survey and bibliography on this subject which will consider both problems of attack and protection. It was noted by the chairman that the information gathered in this study would make a very worthwhile publication.

(10) *Infrared Spectra of Polymers.* Dr. Dubois submitted a report by G. Guiochon and J. Henniker, entitled: "Analysis of Plastics by Infrared Spectroscopy and Gas-Phase Chromatography". This report is scheduled for publication in "Industrie de Plastiques Modernes".

(11) *Spherulites.* Dr. Ecochard is preparing a survey report on spherulites in plastics. It is expected that this report will be ready for circulation to members before the end of this year. After the report has been circulated, Dr. Ecochard will welcome any comments from the members.

(12) *Plastic Materials in the Building Industry.* There is nothing further on Dr. Saccenti's report on "Plastics Materials in the Building Industry: Survey of the Present Situation". Dr. Saccenti has resigned as a member of this section because of his change in position at Montecatini. However, Dr. Saccenti continues to have an interest in the application of plastics in the building industry. The chairman considered that there was nothing particular for this section to do on this item at the present time.

(13) *Symposium at IUPAC Congress, London.* The Plastics and High Polymers Section was a co-sponsor of a symposium on "Food Packaging Materials: Toxicology and Analytical Problems". Nine papers were presented by authors from Belgium, France, Great Britain and the United States. Mr. Rodeyns of this section presented a paper on "Examination of Possible Basic Principles Underlying Legislation on the Use of Plastics in Contact with Food".

(14) *Future Meetings.* The members agreed that the Section should meet during 1964 to expedite progress on the considerable work program that has been undertaken. It was decided that consideration should be given to scheduling a meeting in conjunction with the *1964 European Exhibition and Conference on Plastics*, which is tentatively expected to be held *in Italy in September.* If this does not prove to be feasible, a meeting will be scheduled at some convenient location in Western Europe, immediately preceding *or following the 1964 Fall meeting of ISO/TC 61 being held in Budapest, Hungary.* The members also agreed that the IUPAC Secretariat should be requested to schedule a meeting of the Plastics and High Polymers Section at the 1965 IUPAC Conference in Paris. The 1965 Congress is to be held in Moscow and the Plastics and High Polymers Section Chairman will contact the USSR

National Representatives to ascertain whether the program of the 1965 Congress will include plenary lectures or sessions on plastics and high polymers.

(15) *Name of Plastics and High Polymers Section.* After considerable discussion on the scope of activities covered by the Plastics and High Polymers Section, the Chairman thought it advisable, at present, to retain the name of the section. However, suggestions of new names for the section will be given full consideration.

(16) *Vote of Thanks to Mr. Dring.* All members of the Section expressed their appreciation and thanks to Mr. Dring for his excellent leadership of the Plastics and High Polymers Section during his tenure of the office of Chairman. The members also thanked Mr. Dring for his gracious hospitality during the London meeting.

(17) *Election of Officers and Titular Members.* The following candidates were nominated for officers and titular members of the Section, and were appointed by the Applied Chemistry Division Committee and approved by the Council of the Union:

Chairman: Dr. G.M. Kline (USA), *Secretary:* Dr. A.F. McKay (Canada), *Titular Members:* Dr. M.S. Akutin (USSR), Mr. G. Dring (England), Dr. P. Dubois (France), Dr. O. Leuchs (Germany), Dr. G. Natta (Italy), Dr. T. Wisniewski (Poland).

Arthur F. McKay
Secretary

VI.8 Organic Coatings Section

London, July 5, 8, and 9, 1963

Present at these meetings: Dr. L.A. Jordan, Chairman (England); Mr. H.K. Raaschou Nielsen, Secretary (Denmark), Dr. R. Bult (Netherlands), Dr. B. Cyriax (Germany), Mr. P.H. Fink-Jensen (Denmark), Prof. Dr. K. Hamann (Germany), Dr. M.I. Huss (Sweden), Dr. J.A.W. van Laar (Netherlands), Dr. J.D. von Mikusch (Germany), Dr. L.A. O'Neill (England), Dr. K.M. Oesterle (Switzerland), Mr. E. Oostens (Belgium), Dr. J.J. Raaff (Netherlands), Mr. D.G. Soar (guest) (England), Dr. H.W. Talen (Netherlands), Dr. D. Wapler (Germany); Mr. W.V. Lee (liaison officer of the Oils and Fats Section to the Organic Coatings Section (England).

(1) *General.* Plenary sessions were held on July 5, 8, and 9, 1963. The sessions on July 5 and 8 were presided over by Dr. Jordan. At the beginning of the session on July 9, Dr. Jordan handed over the chairmanship to Mr. Raaschou Nielsen and installed Dr. Bult as Secretary succeeding Mr. Raaschou Nielsen.

In his opening address Mr. Raaschou Nielsen thanked Dr. Jordan for the excellent work and the long service rendered by him to the Organic Coatings Section.

(2) *Sub-Committee on Analytical Methods.* Dr. Talen reported on the activities of the Sub-Committee on Analytical Methods. The methods for the analysis of drying oils are almost ready for publication. At these meetings of the Sub-Committee a number of editorial changes were made.

On the basis of comments by Dr. von Mikusch, Dr. O'Neill and Dr. von Mikusch prepared a new draft for the ultra violet spectrophotometric determination of diene and triene conjugation. Dr. O'Neill will prepare a final version of this new draft very soon.

Mr. RABATÉ has prepared a translation into French of the methods for the analysis of drying oils.

Originally, it was decided to publish these methods together with the new edition of the "Standard Methods for the Analysis of Oils and Fats" of the Oils and Fats Division. As this new edition of the Oils and Fats Division is already printed and on the point of being published, this was no longer feasible.

After having heard the opinion of Mr. W.V. LEE of the Oils and Fats Division (who attended a meeting of the Sub-Committee in his capacity as liaison officer to the Organic Coatings Section) and the account of Dr. VON MIKUSCH (who attended a meeting of the Oils and Fats Division), the Sub-Committee was in favour of publishing the methods for the analysis of drying oils separately as a loose-leaf booklet.

Dr. JORDAN agreed to inform the Editorial Board of IUPAC as soon as possible about the date on which the methods were expected to be ready for printing and about the estimated number of pages.

The Sub-Committee decided to work on the determination of the acid and hydroxyl values of alkyd resins. Drafts of methods for these determinations will be distributed amongst the members together with samples in order to test the methods concerned.

Regarding future activities, the Sub-Committee will soon start on methods for the analysis of paint media other than drying oils and alkyd resins.

The Paint Research Institute TNO in co-operation with the Research Association of Paint Manufacturers in the Netherlands has edited a loose-leaf book covering methods for the qualitative analysis of paint media. The possibility of using this book as a basis for the work of the Sub-Committee in this field will be considered.

(3) *Sub-Committee on Testing Procedures.* Dr. VAN LAAR reported on the activities of the Sub-Committee on Testing Procedures. The book: "Hardness" will contain 5 chapters:

I. Preface by Dr. JORDAN.—II. Introduction by Mr. FINK-JENSEN.—III. Theory by Mr. FINK-JENSEN.—IV. A. Testing Methods by Dr. WAPLER.—B. Hand-methods by Dr. VAN LAAR.—V. National Standards by Mr. RAASCHOU NIELSEN.

Chapters II, III and IV B were finished or practically finished. Chapters IV A and V are expected to be ready at the end of 1963.

When chapters II, III, IV and V are finished, they will be sent to Dr. JORDAN, who will then compose the preface.

It was hoped that the work would be ready for printing in the beginning of 1964. In this case too, Dr. JORDAN agreed to inform the Editorial Board at an early date about the time the book would be ready for printing and the number of pages that it would contain.

The aims of the future work of the Sub-Committee on Testing Procedures were discussed quite extensively.

The Sub-Committee concluded that several possibilities for further work exist:

(a) Collaboration with the "Comité Européen" of the Associations of Manufacturers of Paints and Printing Inks so that the Sub-Committee on Testing Procedures be asked through the IUPAC–OCS to study the scientific background of the standards to be issued by the said association.

(b) Study of principal problems with the ultimate goal of publishing monographs on these problems.

(c) Treatment of general problems in an open discussion to give some directions for b.

(d) Organizing of symposia covering only one or two problems (lectures, discussions).

(4) *Sub-Committee on Terminology.* Dr. JORDAN reviewed the work carried out so far for the trilingual dictionary and gave an account of the meeting of the Sub-Committee under the chairmanship of Mr. H. RABATÉ on July 6.

It appeared that Dr. CYRIAX had achieved the correction of the German part of the book. Unfortunately, only 40% of the English part seemed to be finished and so far no one had been found willing and able to carry out the rest of the work.

Dr. JORDAN also reported on his efforts with IUPAC authorities to get money for the work. Namely, an amount of £2000 as an estimate for the costs of secretarial and mechanical work. He had hoped for a decisive answer on July 8, but had not received this answer.

He was told only that the Editorial Board of IUPAC desired as much information as possible on the basis of which Messrs. Butterworth would make a market survey and report the results back to the Editorial Board. This Board, in its turn, would then inform the Organic Coatings Section of the results of this survey.

Dr. JORDAN concluded that in practice the answer was "no", and again remarked as he did in Brussels that IUPAC publications never imply profit for the authors. He thought that Mr. RABATÉ had better form a consortium now, consisting of the available experts in terminology instead of finishing the work all by himself as he seemed to have in mind at the meeting of the Sub-Committee.

If, however, the OCS would authorize him (Dr. JORDAN) he was prepared to go and speak with Butterworth's to gather all information useful to the Editorial Board.

Dr. RAAFF apologized for not having the time for joining the proposed consortium. At the request of the Netherlands Paint Manufacturers Association he had taken on the job of completing the second edition of his quadrilingual dictionary and that work was still under way.

Dr. TALEN felt that Mr. RABATÉ's work should not be finished without taking full advantage of the linguistic ability of the OCS. He proposed to contact the Netherlands Association for permission for Dr. RAAFF to aid in completion of Mr. RABATÉ's book.

Dr. HAMANN spoke highly of Dr. RAAFF's dictionary and insisted on helping him in finishing his second edition and completing it with definitions.

In conclusion, Dr. JORDAN was authorized to contact Butterworth's and Dr. TALEN's proposal to negotiate with the Netherlands Association was approved.

(5) *Membership.* The following members are titular members: Dr. R. BULT (Netherlands) (new), Mr. A. CAILLIEZ (Belgium), Mr. R.L. HICKSON (England) (new), Dr. M.I. HUSS (Sweden) (new), Dr. J.A.W. VAN LAAR (Netherlands), Dr. K.M. OESTERLE (Switzerland) (new), Mr. H.K. RAASCHOU NIELSEN (Denmark), Dr. D. WAPLER (Germany) (new).

A complete list of members of the Organic Coatings Section will be compiled and sent out to all members.

(6) *Next Place of Meeting.* It was decided to hold the next meeting of the Organic Coatings Section in 1964 in Stuttgart in the last week of September or the first week of October.

(7) *Vote of Thanks to Dr. Jordan.* In addition to the words of the new chairman to Dr. JORDAN, Dr. TALEN called for a vote of thanks to Dr. JORDAN for all his work in connection with the organization of this meeting and for the various social events which were highly appreciated by all members.

COMMISSION INTERNATIONALE DES TABLES DE CONSTANTES

Rapport du Centre européen

Depuis le dernier rapport sur l'activité des Tables de Constantes, paru aux Comptes rendus de l'IUPAC (Comptes rendus de la XXe Conférence, page 303), le Comité de Direction a publié la *Table no 11: Pouvoir rotatoire des Alcaloïdes*, annoncée.

Deux autres ouvrages ont été préparés et publiés: no 12: *Table de Constantes sélectionnées relative aux Semiconducteurs*, établie sous la direction de MM. P. Aigrain et M. Balkanski,

et no 13: *Rendements radiolytiques*, Table établie sous la direction de MM. M. Haïssinsky et M. Magat. La sélection, très soignée, a été assurée par des chercheurs des laboratoires du Radium et de Chimie physique de Paris.

Ces Tables constituent des mises au point de deux sujets d'actualité, à évolution rapide, qui demanderont à être refondues lorsque les données auront été précisées et complétées, voire modifiées.

Dans cette série de mises au point, une nouvelle Table est en cours d'exécution, sous la direction de M. G. Chaudron. Elle se rapporte aux *Métaux de haute pureté.* La sélection des données est assurée par MM. P. Albert et P. Caro. Les seules constantes retenues sont celles relatives à une pureté au moins égale à 99,9%.

D'autre part, pour satisfaire à la demande de nombreux spécialistes, une nouvelle *Table de Pouvoir rotatoire des Stéroïdes* a été préparée sous la direction de MM. J.-P. Mathieu, G. Ourisson et J. Jacques, et est actuellement au dernier stade de la rédaction. Cette Table comprendra plus du double de composés de celle publiée en 1956. Toutes les structures ont été revues à la lumière des derniers résultats de recherches. Les noms répondent aux nouvelles règles proposées par la Sous-Commission de nomenclature de Bâle (mai 1960 – voir le «Bulletin d'Information» no 11). Les cas non prévus par cette Commission ont été discutés avec M. W. Klyne et soumis à l'approbation de M. R.-S. Cahn.

Les points de fusion, qui faisaient défaut dans la première Table, sont mentionnés, ainsi que les mémoires donnant des courbes ou des valeurs de dispersion rotatoire. Un Index détaillé est réalisé dans le même esprit que le premier.

La présentation des ouvrages reste celle de la Table no 11 (composition sur Vari-typer, couverture cartonnée toile, titres et textes bilingues).

Pour chacun de ces ouvrages, un contrat d'édition est passé avec Pergamon-Press qui fait l'avance des prix de composition, de tirage, de reliure et de publicité. Bien que ces sommes viennent en déduction du revenu des ventes, la part qui revient au Comité de Direction (50%) a très largement augmenté grâce à une meilleure diffusion. La Table de Potentiels d'oxydo-réduction, publiée en octobre 1958 à 1500 exemplaires, a dû être rééditée en juin 1962 et plus de 1000 exemplaires des Tables suivantes étaient vendus à la même date (sauf le no 13 sorti récemment).

Ces résultats apparaîtront clairement dans le rapport financier ci-dessous. On pourra même y remarquer des apports privés obtenus par le Comité de Direction pour soutenir la réalisation de Tables relatives à des sujets d'actualité.

Le résumé ci-après des produits et charges de trésorerie des Tables de Constantes à Paris correspond aux livres de comptabilité vérifiés par M. Offroy, expert-comptable à Paris.

RECETTES

Cotisations	Fr.		$	
australiennes (1959, 60, 61, 62)	2 180,74			
belges (1959, 60, 61, 62) . .	15 711,62			
bulgares (1959, 60, 61*) . .	5 878,02			
danoises (1959, 60)	2 848,—			
françaises (1959, 60, 61, 62)	60 000,—			
indiennes (1958, 59, 60, 61*)	7 850,09			
italiennes (1958, 59, 60, 61*)			5200	
norvégiennes (1958, 59, 60, 61, 62)			1000	
polonaises (1959, 60, 61, 62)	14 035,08			
roumaines (1957, 58, 59, 60, 61)	11 052,36			
suisses (1959, 60, 61, 62) . .			5200	
URSS (1959, 60)			2598	
		119 555,91		13 998,—
Subventions				
pour la Table relative aux Semi-conducteurs:				
Bell Telephone			100	
Compagnie française Thomson-Houston	2 500,—			
Compagnie générale de TSF	3 000,—			
La Radiotechnique	1 000,—			
Laboratoire central de Télécommunications	1 000,—			
Péchiney	2 500,—			
Radio Corp. of America . .			100	
pour la Table de Rendements radiolytiques:				
Commissariat à l'Energie atomique	2 500,—			
DuPont de Nemours . . .	2 942,62			
Schering Corporation . . .			500	
Unions des Industries chimiques	2 500,—			
pour la nouvelle Table relative aux Stéroïdes:				
British Drug Houses . . .	342,75			
Ciba	1 996,72			
Délégation à la Recherche scientifique	208 404,—			
A reporter	228 686,09		700	

	Fr.		$	
A reporter	228 686,09		700	
Eli Lilly	2 449,78			
Hoffmann-La Roche	1 000,—			
Organon			1000	
Sandoz	997,81			
Searle			100	
Squibb Institute			500	
Syntex SA			200	
The Upjohn C°			1000	
		233 133,68		3 500,—
Ventes (50%):		106 246,55**		108,13
		458 936,14		17 606,13
Avoir au 1er janvier 1959 .		37 921,90		1 117.10
		496 858,13		18 723,23

* La cotisation 1962 a été versée en 1963

** Dont 48 220,36 pour la seule année 1962

DEPENSES	Fr.		$	
Remboursement partiel de l'avance CNRS		21 230,—		
Indemnité d'auteurs (Table n° 12)	390,—			
Frais de publication (brochage TAC)	4 673,50			
Salaires et charges	285 469,74			
Indemnité de Secrétariat général	6 500,—			
Loyer, frais d'entretien, d'administration, de bureau, de bibliothèque	33 079,29		1324,68	
Frais de déplacements . . .	1 461,—		195.66	1 520.34
Frais de déménagement et d'installation	7 108,91			
		338 682,44		
		359 912,44		1 520.34
Solde au 31 décembre 1962 .		136 945,69		17 202.89
		496 858,13		18 723.23

Nota: Le Secrétariat et la Rédaction à Paris des «Tables de Constantes» ont été transférés en octobre 1962 du 18, rue Pierre-Curie, au 250, rue Saint-Jacques, dans la «Maison Lebel», immeuble appartenant à la Société Chimique de France.

Prof. CH. HAENNY

U.S. NATIONAL RESEARCH COUNCIL
OFFICE OF CRITICAL TABLES

REPORT 1963

During the past two years three data compilation activities have been administered by the National Research Council. Their recent accomplishments are as follows:

(1) The Chemical Kinetics Data Project has published another volume in its continuing series "Tables of Chemical Kinetics, Homogeneous Reactions". The new volume has been issued as National Bureau of Standards Monograph 34. It comprises about 400 pages of data for exchange—substitution and elimination reactions. It is available from the U.S. Government Printing Office, Washington 25, D.C., for $2.75.

(2) The NRC Nuclear Data Project continues its regular publication of loose-leaf tables of nuclear data. In the past biennium it has issued approximately 2000 sheets of data on properties of nuclides including a special supplement of 339 pages by T. Lauritsen and F. Ajzenberg-Selove.

(3) NRC Bulletin 118, "Data on Chemicals for Ceramic Use", will be revised under the sponsorship of the Committee on Ceramic Chemistry. An editor has been selected and the work is proceeding.

The Office of Critical Tables has issued as NRC Publication No. 976 a "Consolidated Index of Selected Property Values, Physical Chemistry and Thermodynamics", that is a guide to the contents of six large compilations. The Consolidated Index will be extended to include other areas of science. The Office of Critical Tables has also issued a "Directory of Continuing Numerical Data Projects", NRC Publication 837. This booklet lists and analyses the activities of all major compilation centers in the U.S.

NATIONAL RESEARCH COUNCIL
OFFICE OF CRITICAL TABLES

RAPPORT 1963

Durant les deux dernières années la compilation des données a été répartie dans trois domaines par le National Research Council. Les résultats actuels sont les suivants:

1º Le Département des Données de Cinétique chimique a publié un autre volume de la série en cours «Tables de Cinétique chimique, Réactions homogènes». Le nouveau volume a été publié sous le nº 34 des Monographies du National Bureau of Standards. Il comprend environ 400 pages de données sur les réactions d'échange (substitution et élimination). On peut se le procurer, au prix de $2.75, à l'adresse: U.S. Government Printing Office, Washington 25, D.C.

2º Le Département des Données nucléaires du NRC continue la publication régulière, en feuille mobiles, de tables de données nucléaires. Durant les deux dernières années, environ 2000 feuilles de données sur les propriétés des nuclides ont été publiées, y compris un supplément spécial de 339 pages par T. Lauritsen et F. Ajzenberg-Selove.

3º Le Bulletin 118 du NRC, «Données sur les produits chimiques employés en Céramique», est en cours de revision sous la direction du Comité de Chimie céramique. Un rédacteur en chef a été choisi et le travail se poursuit.

L'«Office of Critical Tables» a publié sous le nº 976 des Publications du NRC un «Index général des valeurs sélectionnées, physico-chimiques et thermodynamiques», relatif à 6 grosses compilations. L'index général sera étendu à d'autres domaines scientifiques. L'Office of Critical Tables a aussi publié un «Répertoire du Département des Données numériques en cours», Publication NRC nº 837. Ce petit livre donne la liste et l'analyse des activités de tous les principaux centres de compilation des USA.

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